The Impact of Entrepreneurship Training and Small Business Experience on Future Entrepreneurial Activity in the UK

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Abstract

This paper considers three basic questions:

- Who gets enterprise training or work experience in small businesses?
- Does this make a difference to future entrepreneurial activity?
- And, does this improve business outcomes?

Thus, the first strand of considers what types of people get access to enterprise training or gain experience of working in smaller businesses. This will help establish whether these experiences are widely available throughout the general population or whether they are confined to specific groups. The second strand of investigation explicitly questions whether exposure to enterprise training or work experience in smaller businesses has an identifiable impact on the labour market choices that people make subsequently. In short, do people who are exposed to enterprise and smaller business then become more likely to pursue an entrepreneurial career? The final strand questions whether it can make a difference in terms of identifiable business outcomes.

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1 Introduction

The role of human capital has been central to our understanding of what makes an entrepreneur, and whether or not people who do choose an entrepreneurial career path are successful (Cowling, 2000; Cressy, 1996). Researchers have separated out human capital into two broad categories, formal (essentially educational qualifications and experience), and informal (human capital developed through work experiences and familial experience), and questioned whether one or the other 'types' of human capital is more helpful in pursuing an entrepreneurial career (Parker, 2008). Other, more philosophical, research has questioned whether entrepreneurship can be taught at all or whether it is an innate characteristic (see Lee and Wong, 2006, for an excellent review). Finally, the question as to whether enterprise education and training can make a difference to business outcomes has always been open to question and at present suffers from a lack of empirical testing. Whilst there is no definitive answer to any of these questions, the broad evidence base suggests that:

■ Informal human capital is more important in the entrepreneurial sector than the waged sector (Cowling et al, 2004; Taylor, 1996; Burke et al, 2000)

■ Psychological characteristics explain rather less about entrepreneurial behaviour than labour market experience and socio-demographic characteristics (Blanchflower and Oswald, 1998)

■ Entrepreneurship has a formal, managerial and decision-making, element that lends itself to formalised teaching (Cowling, 2003;) [1], and opportunity identification is at the heart of this (Dana, 2001).

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[1]   This paper finds that the addition of non-executive directors to small firms when the founding entrepreneur exits the business can compensate to a large degree for the loss of strategic human capital. Further, the research also finds that there are large and increasing returns-to-scale for managerial staff in small firms.

■ There is evidence that enterprise education increases the probability of starting a new business (Charney and Libecap, 2000) and some, historical, evidence that suggests improved outcomes (Price and Monroe, 1992).

In parallel with this research activity, policy-makers have sought to actively promote entrepreneurship and enterprise as an alternative to waged employment, and, particularly, unemployment. The rationale behind this was that unlocking the latent entrepreneurial talent of the population would create positive economic and social benefits to society. In recent times this has led to the introduction of enterprise teaching in schools, colleges and universities, as well as direct government supported programmes to help people wishing to start their own businesses gain the necessary skills and knowledge. Other interventions have assisted work placements in SMEs with a view to removing the perceived stigma about working in the small business sector (see, for example, SHELL STEP, which placed university students in SMEs).

In this paper, I consider three basic questions:

■ Who gets enterprise training or work experience in small businesses?

■ Does this make a difference to future entrepreneurial activity?

■ And, does this improve business outcomes?

Thus, the first strand of my investigation considers what types of people get access to enterprise training or gain experience of working in smaller businesses. This will help us establish whether these experiences are widely available throughout the general population or whether they are confined to specific groups. The second strand of investigation explicitly questions whether exposure to enterprise training or work experience in smaller businesses has an identifiable impact on the labour market choices that people make subsequently. In short do people who are exposed to enterprise and smaller business then become more likely to pursue an entrepreneurial career? The final strand questions whether it can make a difference in terms of identifiable business outcomes.

2 Data and Methodology

The data I use for this empirical investigation is drawn from the UK 2005 Global Entrepreneurship Monitor adult population survey. In total I have usable observations for around 25,000 UK adults. The survey contains core personal (eg age, education, gender, ethnicity), a regional identifier, key labour market status demographics (starting your own business, existing owner-manager of a business etc), and a socio-economic identifier for the individuals place of domicile. But the key variables that form the basis of my empirical investigation are whether or not an individual has received:

■ Enterprise training at school

■ Enterprise training at college or university

■ Work experience in a smaller business

■ Enterprise training from a government programme

As all these core enterprise training and smaller business work experience variables are coded in binary form as yes or no responses, the most appropriate econometric technique is a binary probit model. The basic procedure is to estimate a series of probit models which take into account the binary nature of the dependent variables which are coded 1 if received enterprise training (or worked in a smaller business) and 0 if not. To allow more meaningful interpretation of the results generated I choose to report the marginal effects of the probit models.

The empirical results were generated using a basic probit model with likelihood function:

$$\ln L = \sum \omega_j \ln \Phi (x_j b) + \sum \omega_j \ln (1 - \Phi (x_j b))$$

where Φ is the cumulative normal distribution. The actual estimates reported are the marginal effects calculated around the means of the independent variables.

If **b** and **V** are denoted as the coefficients and variance matrix then for continuous variables the estimates reported show:

$$b_i^* = \partial\Phi(\mathbf{xb})/\partial x_i \big|_{x=x} = f(\mathbf{xb}) \, b_i$$

where the i's refer to the ith element of **b**. For dummy variables (ther [0,1] coded variables) the estimates reported are for a discrete change in the respective variable from 0 to 1. This is calculated by $b_i^* = \Phi(x_1\mathbf{b}) - \Phi(x_0\mathbf{b})$.

The actual estimating equation can be expressed thus:

$$\Pr(\text{Enterprise training}=1) = \Phi(\beta_0 + \beta_i X_i)$$

, where X is a vector of regional and personal characteristics identified previously. I adopt the same econometric model specification for our second strand of analysis which, separately, estimates models of:

■ Business start-up

■ Owner-management of an existing small business

■ Willingness to start-up a new business in the future

However, in this second strand of analysis I allow for any potential effects from my three enterprise training variables and our small business work experience variable. Next, I adopt a bivariate probit estimation procedure to test for any correlations across my enterprise training and experience models and entrepreneurial outcome models. This will help to identify whether there is any systematic relationship between people who receive (put themselves forward for) enterprise training and subsequently go on to become an entrepreneur. Finally, I examine whether or not enterprise training and experience has any impact on job creating capacity and exporting intensity.

3 Who Receives Enterprise Training or Small Business Work Experience?

The basic sample statistics show that 10.53 per cent of the adult population have received enterprise training in schools, 15.93 per cent have received enterprise training at college or university, and 13.96 per cent through a government programme. It is also the case that 29.21 per cent have had work experience in a smaller business. In the former case, it is clear that a small, but not insignificant minority of the population have been exposed to enterprise training, and in the latter case that nearly one in three adults have had some experience of working in a small business.

Figure 1: School based enterprise training (per cent within age category)
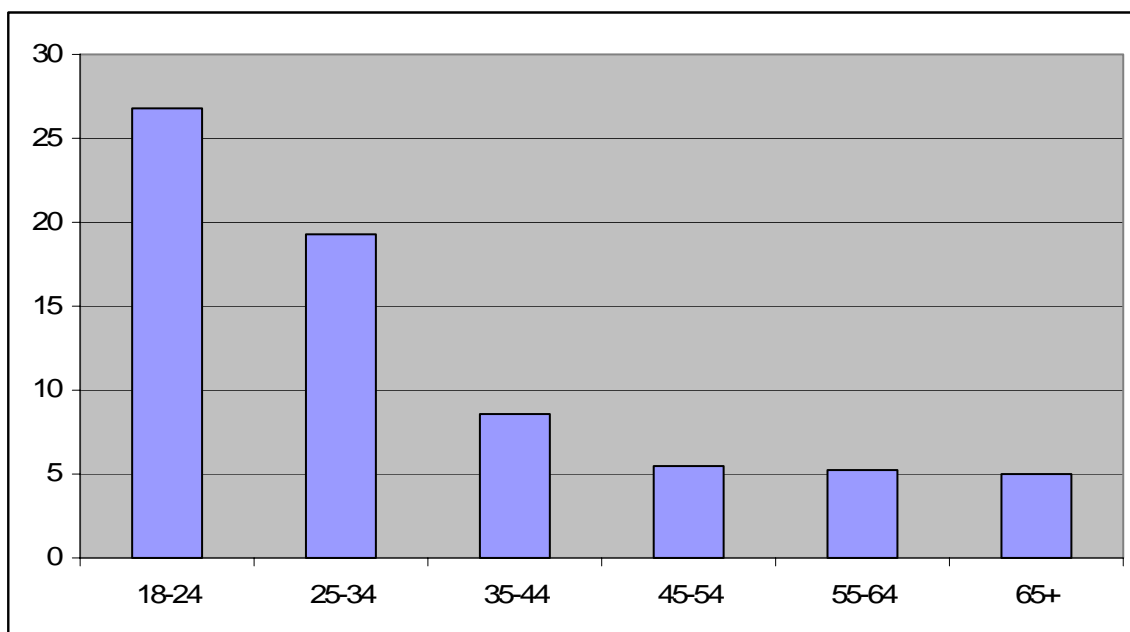
From Figure 1, I note that 26.73 per cent of young people (18-24 year olds) received some enterprise training. For 25-34 year olds (those leaving school in the early to mid-1990s) this was 19.30 per cent, and for 35-44 year olds it is 8.60 per cent. For older people the proportion receiving enterprise training falls sharply and typically only accounts for one in twenty of each age group. Thus enterprise training in schools is a recent phenomenon and has significant coverage amongst the population who have recently left school.

Figure 2: College and university based enterprise training (per cent within age category)
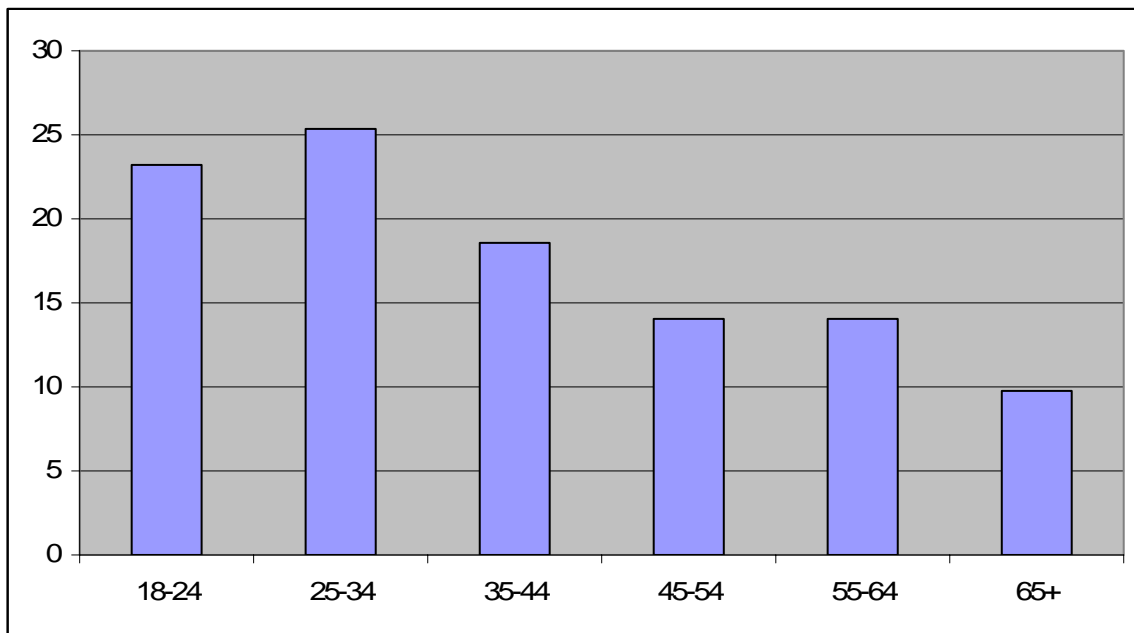
On the prevalence of enterprise training in further and higher education institutions, I note that the pattern follows an inverted 'U' shape peaking at 25.39 per cent amongst 25-34 year olds, although it remains high for people likely to be at in HEIs currently, the 18-24 year olds at 23.27 per cent. After this peak, however, the proportion of adults who received college or university based enterprise training falls as we progress through the age categories, although it is still the case that 9.74 per cent of adults over the age of 65 received some enterprise training at college or university. Again, I note that enterprise training is a more important phenomenon in the modern FE and HE system.

The data show that 30.30 per cent of the adult population have had some work experience in a smaller business. The pattern as we progress through age groups is quite striking, and shows a distinct negative relationship from a peak of 66.43 per cent of 18-24s, to 53.96 per cent of 25-34 year olds, to 32.92 per cent of 35-44 year olds, and only 8.29 per cent of (now retired) 65+ year olds. Whilst this might, in part, reflect the increasing contribution of smaller businesses to our economy over time,

the difference in exposure to smaller businesses amongst younger people is a striking feature of the post-1990 landscape.

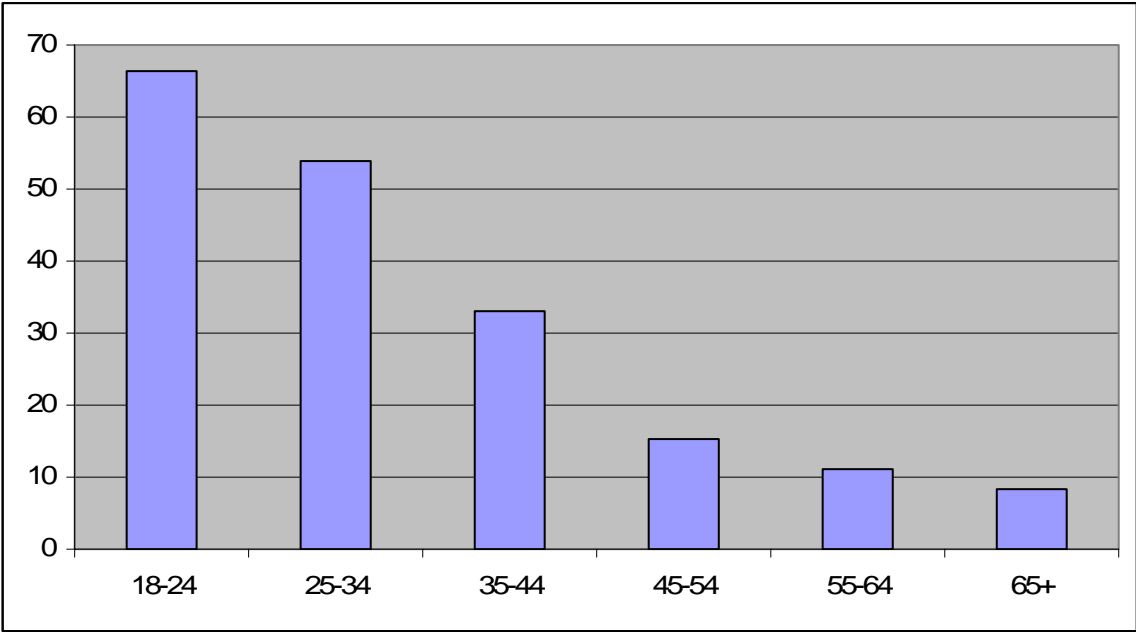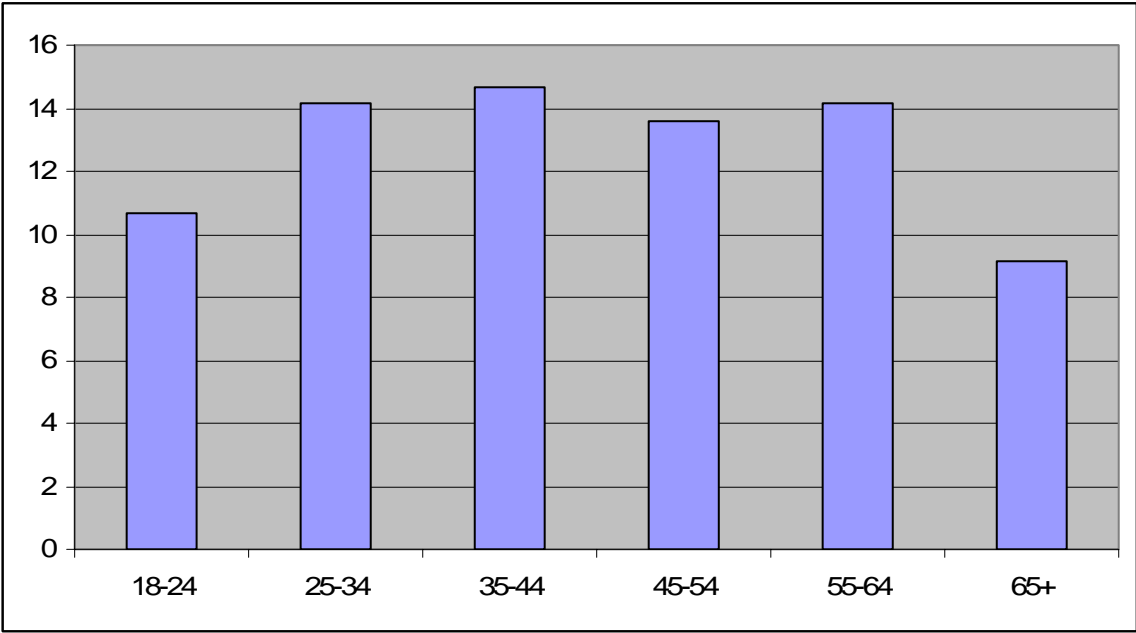**Figure 3: SME work experience (per cent within age category)**

Figure 4: Government enterprise programme (per cent within age category)

The first significant wave of enterprise policy in the form of direct intervention began in the severe recession of the early 1980s. At this time policy was directed at supporting unemployed people into self-employment. The most significant policy, and to date possibly the largest single intervention, was the Enterprise Allowance Scheme, which provided financial and softer support for unemployed people starting up their own business for a period of 12 months. At its peak 103,000 people per annum were supported through the EAS. Since the 1980s, government support for enterprise has often been delivered through intermediary organisations such as Training Enterprise Councils, Business Links, and through the charitable sector (Princes Trust), as well as through contracting arrangements with private sector delivery companies. Further, programmes such as New Deal had an enterprise option.

Figure 4 shows that experience of government supported enterprise programmes is relatively evenly distributed amongst the adult population, particularly when compared to school and college based enterprise training which appears a very modern phenomenon. There is an inverted 'U' shaped pattern in terms of exposure to government enterprise programmes, but in this case the peak of 14.68 per cent amongst 35-44 year olds is less marked when we consider 10.66 per cent of 18-24 year olds and 9.15 per cent of the over-65s also had exposure to government enterprise programmes. To this end, we might conclude that general government enterprise policy had been more consistent over time and targeted the general population at any particular point in time. In a sense this might reflect the fact that earlier policy intervention reacted to economic circumstance, whereas now it is seeking to proactively promote enterprise to future generations. Note that the peak occurred in the deep economic recession of the early 1980s.

3.1 Econometric analysis of enterprise training and work experience in smaller business

3.1.1 School-based enterprise training

Here I econometrically model the probability that individuals with particular characteristics are more (less) likely to have received enterprise training or work experience in a smaller business. The first model estimates the probability that an individual received enterprise training at school. Here I observe that males and females are equally as likely to have received enterprise training. There is no gender bias. The results do confirm the basic sample statistics in that the older a person is the less likely they are to have received enterprise training at school. The marginal effects imply that anyone over the age of 34 is around 9-11 per cent less likely to have had enterprise training at school, holding other factors constant. There also appears to be an education effect, as individuals who subsequently go on to further study are

increasingly more likely to have had enterprise training at school. Some important regional effects were also evident. Here, I find that individuals in Northern Ireland (+5.5 per cent), London (+3.4 per cent), the West Midlands (+2.6 per cent), and the South East (+1.6 per cent) all have a higher probability of having received enterprise training at school. Whether this reflects the availability of funding or simply the preferences of schools in different regions is unclear. Finally, I note that there is no ethnic bias, but schools in the second quintile of the index of multiple deprivation (ie second most deprived areas) tend to give more enterprise training to their pupils.

3.1.2 College and university-based enterprise training

The second form of enterprise training I consider is that provided through colleges and universities. Here I find that there is a gender bias, with males 4.6 per cent more likely to have received enterprise training. Whether this reflects gender differences in the types of degree courses taken is unclear, although anecdotal evidence suggests that engineering and business courses are favoured for business start-up training. It might also reflect a demand phenomenon if female students are less likely to sign up for enterprise training courses. I also find that 18-24 year olds have a 5.7 per cent higher probability than all other age groups of receiving enterprise training. Other than this finding, age did not appear to play a role in the determination of college and university based enterprise training. This suggests that the period since 2002 has marked the start of a new era of enterprise support throughout colleges and universities in the UK. And no regional effects were apparent, suggesting that there is fairly uniform coverage across colleges and universities throughout the UK. But I do find an ethnic effect, with white people being 2.2 per cent less likely to have received enterprise training at college or university. Further, those in the wealthiest (least deprived) areas of the UK are 1.5 per cent less likely to have received college or university based enterprise training.

3.1.3 Work experience in a smaller business

In terms of work experience in smaller businesses, I observe many important effects. For example, males are 1.4 per cent more likely to have work experience in smaller businesses, and white people a 3.2 per cent higher probability. The evidence on age shows a significant decline in the probability of having work experience in smaller businesses through each age group. The difference between an under-18 year old and an 18-24 year old is 7.85 per cent lower for the older group. This rises to 15.2 per cent for 25-34 year olds and 34.6 per cent for 45-54 year olds. This is strong evidence to suggest that work experience in smaller businesses is a very recent phenomenon. I also note that in the North West (-2.3 per cent) and Scotland (-3.3 per cent), adults are less likely to have had work experience in smaller businesses. It is also the case that the more educated an individual is, the greater their exposure to work experience in

smaller businesses, and the effects are substantial. For example, an individual with FE or HE level qualifications is around 20 per cent more likely to have had work experience in a smaller business.

3.1.4 Government enterprise programmes

Finally, I consider exposure to government enterprise programmes. The first point of note is that males have a 2.0 per cent higher probability of having experienced a government enterprise programme. And people from ethnic minorities have a 2.5 per cent higher probability. The peak incidence as far as age is concerned is amongst 35-44 year olds, those who left school in the recession of the early 1980s. The lowest incidence is for young people under the age of twenty-five currently. Education also mattered, and her I find that individuals who did well at school or in further education had higher probabilities of receiving government enterprise training. At the regional level, the evidence is clear cut in that people from Northern Ireland (+6.2 per cent), Scotland (+2.4 per cent), and Wales (+1.8 per cent) all had higher probabilities of receiving government enterprise programme support. Whether this reflects greater levels of provision in these countries, and/or poorer economic performance is unclear.

4 Does Enterprise Training and Experience Affect Future Entrepreneurial Activity?

In this section I cut straight to the econometric models of the determination of (a) business start-up, (b) involvement in a job-related business start-up (c) owner-management of an existing small firm, and (d) probability of starting a business in the future. As the general determinants of participation in these activities are well researched, I only focus on the potential effects of the three modes of enterprise training and having work experience in a smaller business.

4.1 Starting a new business

In terms of the probability of starting a new business currently, receipt of enterprise training in college or university increases the probability by 1.3 per cent. In addition, receiving enterprise support through a government programme increases the probability by 1.5 per cent. These probabilities are statistically significant, but equally importantly, they are substantial in the context of how many people actually start a new business each year in the UK. Take the annual outflow from higher education institutions each year. This outflow amounts to literally hundreds of thousands of young people each year. At present only a fifth receive enterprise training, and these people have a 1.3 per cent higher probability of starting their own business. Thus we might conclude that an expansion of the supply of enterprise training throughout the FE and HE sector might yield a substantial increase in the number of people involved in business start-up activity. However, there may be diminishing returns if colleges and universities have cherry picked those courses most likely to lead to entrepreneurial activity and careers, and focused their scarce resources on providing support to them. This question certainly appears worthy of further investigation.

In terms of access to government enterprise programmes, again we note that the effect on business start-up probabilities is positive and significant. Amongst the adult population we found that total exposure was just under 15 per cent, and peaked in the 1980s. But it still remains the case that many young people today receive

government enterprise support. And this general legacy effect acts to increase the start-up probability across all age groups. This implies that a general, and continued, commitment to government supported enterprise programmes has paid off in terms of increasing the number of people who are currently active in starting their own business. Whether the costs of such provision are justified by the additional economic activity is an issue for policy evaluation, but the basic premise is that policy intervention of this type has achieved its primary goal of increasing the business start-up rate.

4.2 Job related start-up

Next I focus on what is loosely termed job related start-up activity in Global Entrepreneurship Monitor terms. This is akin to what business researchers often call intrapreneurship, or entrepreneurial activity within an existing firm. Economists might associate this with endogenous growth. It may subsequently lead to spin-out activity, but as it is measured here it simply relates to workers who are engaged in a new business activity as part of their normal job function. Here I find that college or university based enterprise training increases the probability that an individual will become involved in job related start-up activity by 0.4 per cent, and school based enterprise training by 0.3 per cent. Further, government enterprise programmes increase this probability by 0.4 per cent. Although the scale of these effects is much smaller than for independent business start-up activity, this may reflect the relative difficulty of pursuing entrepreneurial activities within the formalised structures of firms. What is does suggest is that for firms that are undertaking such activities within the context of their businesses the types of people they are more likely to get engaged on these projects are more likely to be those that have access to enterprise training of all forms. Thus our evidence might suggest a positive dynamic generated by all forms of enterprise training is that firms themselves become more entrepreneurial or at least make use of the people with enterprising human capital.

4.3 Owner-manager of a small business

The third measure of entrepreneurial behaviour is being an owner-manager of an existing small business. Here again, I find that receiving enterprise training through a college or university or from a direct government programme increase the respective probabilities that an individual is currently an owner-manager of a small business by 2.3 per cent and 3.0 per cent respectively. The scale of these effects is large, and implies that exposure to enterprise training achieves its primary goal of increasing entrepreneurial activity rates. Again, this is consistent with a legacy effect from individuals receiving enterprise training in their life and then using this entrepreneurial human capital at some point in the future.

4.4 Future start-up potential

Next, I consider whether or not enterprise training affects an individual willingness in the future to start up their own business. The results on this show that people receiving enterprise training at college or university have a 3.2 per cent higher probability of starting a new business in the future, and that those who have received enterprise training through a government programme have a 4.0 per cent higher probability. In addition, those who have had work experience in a smaller business have a 1.4 per cent higher probability. This evidence strongly suggests that exposure to enterprise training, at the minimum, raises peoples' awareness of entrepreneurial activity and instils a more positive attitude towards enterprise as a career option.

Thus far we have found that:

- Enterprise training provided by colleges and universities does generally lead to higher levels of current entrepreneurial activity

- Enterprise training provided by government programmes does generally lead to higher levels of current entrepreneurial activity

- Enterprise training provided by schools generally has little effect on current levels of entrepreneurial activity, although it may be too soon to identify these effects

- Work experience in smaller business does not seem to affect current levels of entrepreneurial activity

- All forms of enterprise training and work experience in smaller businesses , with the exception of that provided by schools, appears to change peoples attitudes, in a positive way, towards becoming involved in entrepreneurial activity in the future

Thus the picture presented so far is generally positive in terms of the actual effects of receiving enterprise training on current entrepreneurial activity and the potential future intentions to pursue an entrepreneurial career path. But this portrayal may be slightly misleading if those individuals with the greatest desire, *a priori*, to pursue an entrepreneurial career path, select into enterprise training. Thus it becomes self-fulfilling that those who elect to get training then go on to start their own businesses. Whilst this might be less of an issue in schools, as pupils are not likely to be offered a choice, it may be in colleges and universities, and also on government programmes. However, this is not clear cut if enterprise training is course based as part of the standard curriculum, and hence compulsory to attend, and in the case of government programmes if, say, the long-term unemployed have little choice but to attend some form of work-based training.

To address these specific concerns I estimate a set of bivariate probit equation systems that allow for cross-equation correlation. These models take the general form:

$$\begin{cases} Y_1 &= 1_{(Y_1^*>0)} \\ Y_2 &= 1_{(Y_2^*>0)} \end{cases}$$

Y_1 and Y_2 are two binary dependent variables.

with

$$\begin{cases} Y_1^* &= X\beta_1 + \varepsilon_1 \\ Y_2^* &= X\beta_2 + \varepsilon_2 \end{cases}$$

And:

$$\begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \end{pmatrix} |X \sim \mathcal{N}\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \right)$$

For example, the first set of equations are for school based enterprise training and business start-up. Here the likelihood ratio (LR) test for $\rho=0$ has a significance level of only 0.624, indicating no systematic relationship between the equations. The full set of LR tests and their significance levels are presented below in Table 4.1.

Table 4.1: LR tests for ρ=0

Enterprise support / experience	Entrepreneurial activity			
	Business start-up	Job related business start-up	Owner-manager	Future start-up intention
School	0.624	0.412	0.100	0.001
College / University	0.001	0.122	0.001	0.001
Work experience	0.003	0.033	0.004	0.001
Government programme	0.001	0.024	0.001	0.001

For those who have received enterprise support in school, I do find that they are marginally more likely to be the owner-manager of an established business and strongly more likely to start-up a business in the future. For college and university students who have received enterprise training the results suggest that there are significantly more likely to start-up a new business, be an existing owner-manager and intend to start-up a business in the near future. Further, for those who have gained work experience in a smaller business or received government backed enterprise support, the results show a strong tendency towards participation in all current and future modes of entrepreneurial activity. Thus, on balance, it appears

that promoting enterprise in the education system, and via government backed enterprise programmes does have the desired policy outcome in that people who received these modes of support are generally more likely to become involved in entrepreneurial activity. It is also the case that gaining work experience in smaller businesses increases an individuals' willingness to become an entrepreneur.

But the evidence here also suggests that those who are most likely to pursue an entrepreneurial career also are those most likely to receive enterprise training or gain work experience in a smaller business. There are two arguments that could be put forward here. Firstly, this is good as it provides willing participants with new knowledge and the tools to become more successful when they embark on an entrepreneurial career path. In short, the provision of enterprise training and education acts as a filter to discriminate between the unwilling and unlikely and future entrepreneurs. Thus support naturally gets to those who will make most use of it. But, it may be the case that expanding enterprise training and education has diminishing returns as it becomes harder to convince the unwilling that they have an entrepreneurial future. However, even if there are diminishing returns to expanding the availability of enterprise training and education, it is absolutely not clear that we have reached the point where the returns are negative (ie where there is too much enterprise education and training for the numbers of people who might subsequently benefit). One could argue that as the peak time for starting and entrepreneurial career is typically between 35 and 45 years old, it is a useful addition to the general human capital of any school pupil, FE or HEI student.

5 Business Outcomes

5.1 Business outcomes

The final piece of evidence offered seeks to answer the question of whether enterprise training and education or work experience leads to better business outcomes. In short, other than increasing the overall level of entrepreneurial activity, are the recipients of support or informal work experience more likely to run businesses with higher performance levels? Here I estimate two models, one for job creation in existing small businesses, and one for exporting intensity. These performance measures are selected for two reasons. Firstly they are available in the GEM UK data set, and secondly, because both have clear and direct outcomes for the UK economy. The job model is estimated by ordinary least squares (OLS) and the exporting intensity model by ordered probit as the export share is coded in bands from zero to one hundred percent.

5.1.1 Employment

On jobs in established smaller businesses, I find that male entrepreneurs are associated with higher employment levels, as are ethnic minority entrepreneurs. Interestingly, the ethnic effect is substantially larger in scale than the gender effect. There is also an interesting, and non-linear relationship between job creation and age of entrepreneur.

From Fig 5.1 (below) it is apparent that job creation peaks in smaller businesses run by entrepreneurs in the 40-45 year old age bracket. Prior to that job creation is increasing in age of entrepreneur and beyond 45 is diminishing as entrepreneurs get older. Thus for younger entrepreneurs, if they can manage to survive in business it is likely that they will create additional jobs. But for third age entrepreneurs, it is likely that their job creating potential is past its peak.

Fig 5.1: Entrepreneur age and job creation
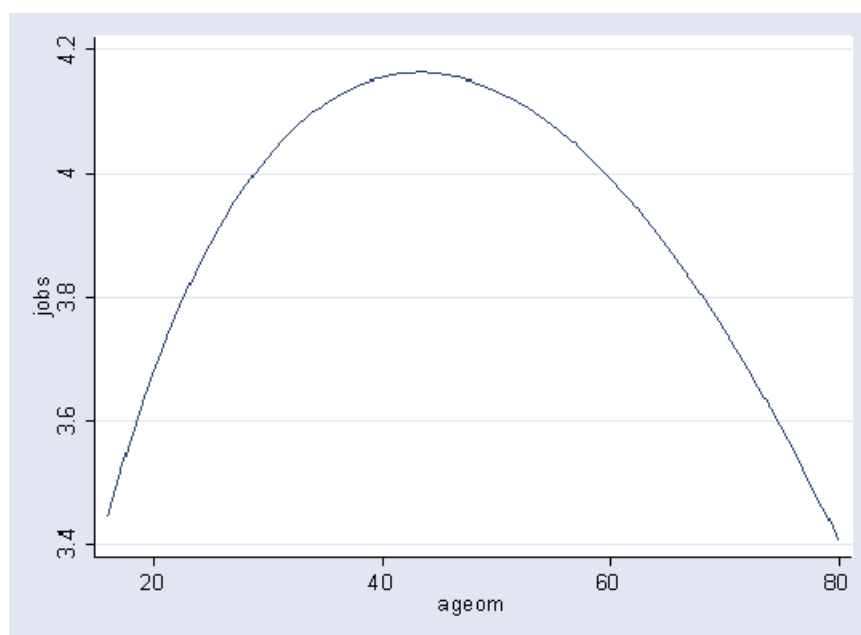
Finally, and in relation to enterprise training and work experience, I find that school based enterprise training is associated with higher job creation. This was also the case for entrepreneurs who had prior experience of working in smaller businesses. However, the school effect was substantially larger than the work experience effect. This suggests that more formal, and specialist, enterprise education is of greater value than less specialised, informal, work experience at least as far as job creation is concerned.

5.1.2 Exporting

In terms of exporting intensity, the model shows that gender and ethnicity do not appear to play a role. However, as with job creation, age of entrepreneur does seem to matter. But here we note that exporting intensity is lowest amongst 40-45 year old entrepreneurs, and highest amongst the very youngest and oldest entrepreneurs. Why this is the case is unclear, but this 'U' shaped relationship is very identifiable from the model.

Finally, I find that there is a positive relationship between entrepreneurs who received government backed enterprise support and exporting intensity, and a smaller, but still positive, effect for those who received enterprise training at college or university. Again these findings suggest that more direct forms of enterprise support appear to benefit entrepreneurs more than less formal, and specialist, modes of human capital development.

6 Conclusions

I have used a large scale UK data set to examine three basic questions; who gets enterprise training (or work experience)? does it increase their chances of becoming an entrepreneur? and, if they do, does it improve their business outcomes? The raw data show that 10.5 per cent of the adult population have received enterprise education or training in schools, 15.9 per cent at college or university, 14.0 per cent through a government supported programme, and 29.2 per cent had gained work experience in a smaller business. It is also the case that, with the notable exception of government supported enterprise training, which is widely distributed throughout the population, all other forms of education, training and work experience are relatively recent phenomenon and concentrated amongst younger people.

The econometric evidence show that the availability of school based enterprise education depends heavily upon where you live, with pupils in Northern Ireland, London, the West Midlands and the South East all having a much higher probability of receiving an enterprise education. Whether this relates to funding streams or choice is unclear and merits further investigation as it may lead to regional imbalances in future entrepreneurial activity. However, this is mitigated, to a degree, by the uniform provision of enterprise training and education in the HEI sector across regions. It is also apparent that the period since 2002 marks the start of a new era as far as enterprise training and education in the HEI system. Yet this is not uniform across students, as male students as substantially more likely to receive such training than females, as are ethnic minorities.

The findings regarding work experience in a smaller business also show some distinct patterns in terms of what types of people have these experiences. For example, males, and white people are more likely to have had work experience in a smaller business than females and ethnic minorities. And there is a large and positive education effect, with more educated individuals being substantially more likely to have built up informal human capital through working in a smaller business. This suggests that there is a large difference in human capital accumulation at the formal and informal level for the most educated compared to the least educated. This

education effect was also identified in terms of accessing government supported enterprise programmes, as did the positive male and ethnic minority effects. And again there are regional imbalances, although they may be accounted for by relative differences in economic growth and labour market opportunities as Northern Ireland, Scotland and Wales had much higher provision than English regions.

So do these modes of enterprise education and training and work experience actually make a tangible difference to an individuals decision to become an entrepreneur? The evidence suggests that college and university based enterprise education and training make a significant difference across all forms of enterprise activity as well as future potential entrepreneurial activity. The same is true for government supported enterprise programmes. But this does not appear to be the case for school based enterprise education, although it may simply be too early to pick up these effects. Nor does work experience in a smaller business appear to stimulate future entrepreneurial activity, which might suggest that this kind of informal human capital development is less relevant to running a business. However, whilst it is true that promoting enterprise through the HEI system and through government supported programmes does have the desired effect if increasing enterprise activity rates, there is also some element of self-selection as those most likely to pursue and entrepreneurial career are also those most likely to receive enterprise training and support. In this sense one could argue that this is fine as resources are targeted at the most willing and hence most likely to make use of their new knowledge. But it is less effective, although not completely ineffective, at convincing the unwilling to consider an entrepreneurial career path.

Having found that enterprise education and training is generally becoming more widely available in the UK, and that this has had an effect on entrepreneurial activity rates, the final question is has it improved quality of entrepreneurs. Here the results do show some positive effects with schools based enterprise education and work experience acting positively on job creation, and college / university and government supported training being associated with greater exporting capacity. These findings suggest that there are positive benefits in terms of enhancing quality of entrepreneurs and that all modes of enterprise support and informal human capital development have a positive role to play.

At a policy level, it appears that enterprise education is well integrated into the FE and HE system, but as yet not widely available in the school system. If policy-makers are minded to create a continuous ladder of enterprise education starting in schools and continuing on though the education system and into the formal labour market, this patchy provision needs to be addressed at the earliest level, and potentially at later stages where large regional imbalances are evident in terms of accessing government supported enterprise training. And policy-makers must decide whether they want to target resources at the 'most willing' or adopt a more inclusive agenda

which would seek to change mindsets of the 'unwilling'. At present, the impact on quantity is positive, but less impressive than the impact on quality.

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Results Tables

Model 1   Enterprise training in school

Probit estimates   Number of obs = 25,318
LR chi2(27) =1752.89
Prob > chi2 = 0.0000
Log likelihood = -7587.0588
Pseudo R2 = 0.1036

School	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
Male	0.0031	0.0035	0.87	0.382	0.4078	-0.0038	0.0099
Age							
18-24	-0.0282	0.0086	-2.86	0.004	0.0732	-0.0450	-0.0113
25-34	-0.0639	0.0066	-7.55	0	0.1753	-0.0768	-0.0510
35-44	-0.1083	0.0058	-14	0	0.2371	-0.1198	-0.0969
45-54	-0.1150	0.0049	-16.08	0	0.2036	-0.1246	-0.1054
55-64	-0.1084	0.0044	-15.59	0	0.1739	-0.1171	-0.0997
65+	-0.0980	0.0037	-14.73	0	0.1217	-0.1052	-0.0908
Education							
Basic	0.0918	0.0077	12.42	0	0.4223	0.0768	0.1069
School	0.0860	0.0119	8.57	0	0.1310	0.0627	0.1094
Higher	0.1283	0.0105	14.25	0	0.2607	0.1077	0.1488
Region							
East	0.0112	0.0127	0.93	0.355	0.0308	-0.0136	0.0360
London	0.0339	0.0122	3.1	0.002	0.0453	0.0100	0.0579
North East	-0.0065	0.0115	-0.55	0.585	0.0318	-0.0290	0.0161
North West	0.0046	0.0087	0.54	0.592	0.0916	-0.0124	0.0216
N Ireland	0.0554	0.0094	6.74	0	0.1590	0.0370	0.0737
Scotland	0.0122	0.0100	1.28	0.201	0.0637	-0.0074	0.0319
S East	0.0163	0.0092	1.86	0.062	0.0921	-0.0018	0.0344
S West	0.0085	0.0123	0.71	0.476	0.0325	-0.0156	0.0325

School	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]
Wales	0.0045	0.0072	0.63	0.526	0.2345	-0.0096	0.0186
W Midlands	0.0261	0.0134	2.14	0.033	0.0324	-0.0002	0.0523
Yorks & Humber	0.0074	0.0087	0.86	0.388	0.0932	-0.0098	0.0245
White	-0.0023	0.0074	-0.31	0.754	0.9464	-0.0168	0.0122
Deprivation quintile							
Q2	0.0108	0.0057	1.94	0.052	0.1956	-0.0004	0.0220
Q3	0.0073	0.0058	1.28	0.2	0.1863	-0.0041	0.0186
Q4	0.0073	0.0058	1.28	0.201	0.1988	-0.0041	0.0186
Q5	0.0077	0.0059	1.33	0.183	0.2087	-0.0038	0.0192

obs. P   .1,042,341
obs. P   .1,567,685
pred. P   .0,823,203 (at x-bar)
pred. P   .1,350,342 (at x-bar)

Model 2: Enterprise training in college or university

Probit estimates
Number of obs = 25,375
LR chi2(27) =1,512.34
Prob > chi2 = 0.0000
Log likelihood = -10,263.488
Pseudo R2 = 0.0686

College/University	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
Male	0.0462	0.0045	10.41	0	0.4077	0.0373	0.0550
Age							
18-24	0.0570	0.0231	2.72	0.006	0.0731	0.0118	0.1023
25-34	0.0290	0.0199	1.52	0.128	0.1754	-0.0100	0.0679
35-44	0.0047	0.0183	0.26	0.794	0.2374	-0.0311	0.0406
45-54	-0.0223	0.0170	-1.26	0.207	0.2034	-0.0556	0.0111
55-64	-0.0192	0.0173	-1.07	0.283	0.1738	-0.0530	0.0147
65+	-0.0300	0.0167	-1.68	0.094	0.1217	-0.0628	0.0028
Education							
Basic	0.1790	0.0100	18.12	0	0.4224	0.1594	0.1985
School	0.2645	0.0161	19.25	0	0.1310	0.2330	0.2960
Higher	0.3186	0.0134	26.23	0	0.2608	0.2923	0.3448
Region							
East	-0.0069	0.0137	-0.5	0.619	0.0308	-0.0337	0.0199
London	0.0132	0.0128	1.07	0.286	0.0452	-0.0118	0.0383
North East	0.0038	0.0143	0.27	0.788	0.0317	-0.0243	0.0320
North West	-0.0074	0.0098	-0.75	0.455	0.0915	-0.0267	0.0118
N Ireland	0.0009	0.0089	0.1	0.923	0.1591	-0.0165	0.0182
Scotland	-0.0054	0.0108	-0.5	0.62	0.0638	-0.0266	0.0158
S East	-0.0070	0.0097	-0.71	0.477	0.0922	-0.0260	0.0120
S West	-0.0141	0.0130	-1.04	0.298	0.0324	-0.0396	0.0115
Wales	-0.0105	0.0081	-1.27	0.203	0.2344	-0.0264	0.0054
W Midlands	0.0011	0.0139	0.08	0.936	0.0325	-0.0261	0.0283
Yorks & Humber	0.0013	0.0100	0.13	0.9	0.0932	-0.0183	0.0208
White	-0.0221	0.0103	-2.25	0.025	0.9466	-0.0422	-0.0020
Deprivation quintile							
Q2	-0.0055	0.0065	-0.83	0.405	0.1959	-0.0182	0.0073
Q3	-0.0007	0.0068	-0.1	0.92	0.1863	-0.0139	0.0126
Q4	-0.0087	0.0067	-1.28	0.2	0.1987	-0.0218	0.0044
Q5	-0.0151	0.0068	-2.19	0.029	0.2084	-0.0284	-0.0019

Model 3: Work experience in smaller business

Probit estimates Number of obs = 25,341
LR chi2(27) =5,413.19
Prob > chi2 = 0.0000
Log likelihood = -12,585.625
Pseudo R2 = 0.1770

Work experience	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
Male	0.0142	0.0059	2.39	0.017	0.4079	0.0025	0.0258
Age							
18-24	-0.0785	0.0201	-3.55	0	0.0734	-0.1179	-0.0391
25-34	-0.1523	0.0170	-7.6	0	0.1754	-0.1856	-0.1190
35-44	-0.2715	0.0136	-15.06	0	0.2372	-0.2981	-0.2449
45-54	-0.3458	0.0092	-22.69	0	0.2030	-0.3639	-0.3277
55-64	-0.3454	0.0078	-24.24	0	0.1739	-0.3606	-0.3302
65+	-0.3219	0.0058	-24.71	0	0.1218	-0.3333	-0.3104
Education							
Basic	0.1896	0.0106	17.83	0	0.4224	0.1689	0.2104
School	0.2015	0.0145	14.76	0	0.1310	0.1730	0.2300
Higher	0.2187	0.0124	18.3	0	0.2609	0.1944	0.2431
Region							
East	-0.0068	0.0187	-0.36	0.718	0.0307	-0.0434	0.0298
London	-0.0017	0.0167	-0.1	0.92	0.0451	-0.0344	0.0310
North East	0.0143	0.0196	0.74	0.459	0.0316	-0.0241	0.0527
North West	-0.0233	0.0131	-1.74	0.082	0.0917	-0.0491	0.0024
N Ireland	0.0205	0.0122	1.7	0.089	0.1591	-0.0035	0.0444
Scotland	-0.0329	0.0141	-2.26	0.024	0.0639	-0.0606	-0.0053
S East	0.0051	0.0136	0.38	0.706	0.0920	-0.0216	0.0318
S West	0.0086	0.0190	0.46	0.646	0.0324	-0.0286	0.0458
Wales	-0.0168	0.0111	-1.5	0.134	0.2344	-0.0385	0.0049
W Midlands	0.0220	0.0193	1.16	0.246	0.0326	-0.0159	0.0599
Yorks & Humber	-0.0145	0.0132	-1.08	0.278	0.0931	-0.0403	0.0113
White	0.0319	0.0120	2.57	0.01	0.9467	0.0084	0.0555
Deprivation quintile							
Q2	0.0061	0.0091	0.67	0.504	0.1958	-0.0118	0.0240
Q3	0.0048	0.0093	0.52	0.605	0.1862	-0.0135	0.0231
Q4	-0.0164	0.0092	-1.77	0.077	0.1988	-0.0343	0.0016
Q5	-0.0081	0.0094	-0.86	0.391	0.2083	-0.0266	0.0103

obs. P .2,914,644
pred. P .2,511,243 (at x-bar)

Model 4   : Government supported enterprise training

Probit estimates Number of obs = 25,352
LR chi2(27) = 533.60
Prob > chi2 = 0.0000
Log likelihood = -9962.9515
Pseudo R2 = 0.0261

Government programme	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
Male	0.0204	0.0044	4.69	0	0.4080	0.0118	0.0291
Age							
18-24	0.0340	0.0239	1.52	0.129	0.0731	-0.0128	0.0809
25-34	0.0646	0.0240	2.93	0.003	0.1755	0.0175	0.1117
35-44	0.0835	0.0240	3.81	0	0.2371	0.0365	0.1304
45-54	0.0728	0.0241	3.3	0.001	0.2034	0.0256	0.1200
55-64	0.0787	0.0250	3.49	0	0.1739	0.0297	0.1276
65+	0.0514	0.0245	2.28	0.022	0.1217	0.0035	0.0994
Education							
Basic	0.1161	0.0080	14.88	0	0.4224	0.1003	0.1318
School	0.1593	0.0126	14.84	0	0.1309	0.1347	0.1839
Higher	0.1500	0.0103	16.28	0	0.2609	0.1298	0.1701
Region							
East	0.0224	0.0155	1.52	0.129	0.0308	-0.0080	0.0528
London	-0.0088	0.0123	-0.7	0.483	0.0451	-0.0329	0.0153
North East	0.0020	0.0145	0.14	0.892	0.0316	-0.0265	0.0304
North West	0.0077	0.0105	0.74	0.458	0.0917	-0.0129	0.0283
N Ireland	0.0618	0.0105	6.38	0	0.1594	0.0411	0.0824
Scotland	0.0242	0.0122	2.08	0.037	0.0638	0.0003	0.0481
S East	-0.0002	0.0103	-0.02	0.984	0.0922	-0.0203	0.0199
S West	-0.0163	0.0134	-1.17	0.243	0.0324	-0.0425	0.0099
Wales	0.0184	0.0089	2.13	0.033	0.2341	0.0010	0.0358
W Midlands	0.0130	0.0148	0.91	0.364	0.0326	-0.0159	0.0420
Yorks & Humber	0.0064	0.0104	0.63	0.532	0.0931	-0.0140	0.0268
White	-0.0255	0.0108	-2.48	0.013	0.9464	-0.0467	-0.0043
Deprivation quintile							
Q2	0.0135	0.0069	1.99	0.047	0.1961	-0.0001	0.0271
Q3	0.0064	0.0070	0.91	0.36	0.1861	-0.0074	0.0201
Q4	0.0121	0.0071	1.74	0.083	0.1986	-0.0018	0.0261
Q5	0.0153	0.0073	2.15	0.032	0.2084	0.0010	0.0296

obs. P .1.392.001
pred. P .1.319.557 (at x-bar)

Model 5   : Employment size of business

Robust regression estimates Number of obs = 1,887
$F(27, 1859) = 2.25$
Prob > F = 0.0003

	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Male	0.1507	0.0862	1.75	0.081	-0.0183	0.3197
lnAge	1.2740	0.5577	2.28	0.022	0.1802	2.3678
agesq	-3.4003	1.3413	-2.54	0.011	-6.0309	-0.7698
Education						
Basic	-0.0378	0.1353	-0.28	0.78	-0.3031	0.2274
School	-0.2696	0.1610	-1.67	0.094	-0.5853	0.0462
Higher	-0.1441	0.1403	-1.03	0.304	-0.4192	0.1310
Region						
East	-0.1837	0.2561	-0.72	0.473	-0.6860	0.3187
London	-0.0883	0.2317	-0.38	0.703	-0.5426	0.3660
North East	0.2640	0.3357	0.79	0.432	-0.3944	0.9225
North West	0.0078	0.2013	0.04	0.969	-0.3869	0.4026
N Ireland	-0.0320	0.1723	-0.19	0.853	-0.3700	0.3060
Scotland	-0.5429	0.2162	-2.51	0.012	-0.9670	-0.1189
S East	-0.1887	0.1776	-1.06	0.288	-0.5370	0.1596
S West	-0.3476	0.2276	-1.53	0.127	-0.7940	0.0989
Wales	-0.1712	0.1559	-1.1	0.272	-0.4769	0.1345
W Midlands	0.0419	0.2441	0.17	0.864	-0.4369	0.5207
Yorks & Humber	-0.2466	0.1864	-1.32	0.186	-0.6121	0.1189
White	-0.5672	0.1942	-2.92	0.004	-0.9480	-0.1864
Deprivation quintile						
Q2	-0.0269	0.1177	-0.23	0.819	-0.2576	0.2039
Q3	0.1077	0.1244	0.87	0.386	-0.1362	0.3516
Q4	-0.0464	0.1306	-0.36	0.722	-0.3026	0.2097
Q5	-0.1933	0.1474	-1.31	0.19	-0.4825	0.0959
Enterprise support						
enttrain1 (school)	0.4216	0.1474	2.86	0.004	0.1325	0.7108
enttrain2 (college)	-0.1102	0.1074	-1.03	0.305	-0.3208	0.1003
enttrain3 (work exp)	0.2665	0.1020	2.61	0.009	0.0665	0.4666
enttrain4 (gov't programme)	-0.0365	0.1054	-0.35	0.729	-0.2432	0.1703
_cons	-2.4091	1.8513	-1.3	0.193	-6.0399	1.2217

Model 6: Exporting intensity of business

Ordered probit estimates Number of obs =1,902
LR chi2(27) = 101.65
Prob > chi2 = 0.0000
Log likelihood = -1213.3845
Pseudo R2 = 0.0402

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Male	-0.0281	0.0741	-0.38	0.704	-0.1733	0.1171
lnAge	-1.2549	0.4401	-2.85	0.004	-2.1175	-0.3923
agesq	3.2813	1.0724	3.06	0.002	1.1795	5.3831
Education						
Basic	-0.0689	0.1212	-0.57	0.57	-0.3065	0.1686
School	-0.1273	0.1459	-0.87	0.383	-0.4132	0.1586
Higher	0.2340	0.1209	1.94	0.053	-0.0029	0.4709
Region						
East	0.3180	0.2242	1.42	0.156	-0.1214	0.7575
London	0.4526	0.1976	2.29	0.022	0.0654	0.8399
North East	-0.4907	0.4498	-1.09	0.275	-1.3723	0.3908
North West	0.1906	0.1881	1.01	0.311	-0.1780	0.5592
N Ireland	0.5333	0.1537	3.47	0.001	0.2320	0.8346
Scotland	0.3454	0.1900	1.82	0.069	-0.0270	0.7177
S East	0.4481	0.1596	2.81	0.005	0.1354	0.7609
S West	0.2589	0.2033	1.27	0.203	-0.1396	0.6574
Wales	0.3676	0.1449	2.54	0.011	0.0837	0.6516
W Midlands	-0.1549	0.2572	-0.6	0.547	-0.6589	0.3491
Yorks & Humber	0.0397	0.1792	0.22	0.825	-0.3115	0.3909
White	-0.1489	0.1594	-0.93	0.35	-0.4613	0.1635
Deprivation quintile						
Q2	0.0333	0.1018	0.33	0.744	-0.1663	0.2328
Q3	0.1886	0.1045	1.8	0.071	-0.0163	0.3934
Q4	0.2167	0.1089	1.99	0.047	0.0032	0.4301
Q5	-0.3915	0.1459	-2.68	0.007	-0.6775	-0.1055
Enterprise support						
enttrain1 (school)	0.0825	0.1200	0.69	0.491	-0.1526	0.3177
enttrain2 (college)	0.1487	0.0883	1.68	0.092	-0.0243	0.3217
enttrain3 (work exp)	0.0182	0.0877	0.21	0.836	-0.1538	0.1901
enttrain4 (gov't programme)	0.1929	0.0862	2.24	0.025	0.0239	0.3618
_cut1	-2.6664	1.4530		(Ancillary	parameters)	
_cut2	-2.5184	1.4529				
_cut3	-2.2642	1.4529				
_cut4	-2.0085	1.4529				
_cut5	-1.8133	1.4529				