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WHAT MAKES A YOUNG ENTREPRENEUR?

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ABSTRACT

The paper studies the factors which shape entrepreneurship among young adults. It finds, using data on a British birth cohort, that the probability of self-employment depends sensitively upon whether the individual ever received a gift or inheritance. Those who were given or inherited £5,000, for example, were approximately twice as likely, *ceteris paribus*, to set up in business. This is consistent with, and a new test of, recent results from the US stressing the importance of capital and liquidity constraints. The paper also evaluates a number of hypotheses suggested in the literature on small businesses.

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" For many commentators this is the era of the entrepreneur. After years of neglect, those who start and manage their own businesses are viewed as popular heroes. They are seen as risk-takers and innovators who reject the relative security of employment in large organisations to create wealth and accumulate capital. Indeed, according to many, the economic recovery of the European economies is largely dependent upon their ambitions and efforts."

(Goffee and Scase (1987), p.1.)

Introduction

This paper explores the forces which make and shape entrepreneurs. Public and political interest in this topic is now high and a small economics literature is beginning to be established. Nevertheless, it is still true that economists have a lot to learn about entrepreneurship, and the paper's aim is to contribute to this endeavour.

The main reason that governments have taken keen interest in the determinants of entrepreneurship is that they see small businesses as a source of new jobs. This is one rationale -- stimulated in part by the work of Birch (1979) -- for fostering entrepreneurship. Another is that entrepreneurial activity is ultimately the mainspring of growth and development in a free market economy, so there are grounds to wish to understand it and, where feasible, to improve its quality. The primary difficulty for the social scientist is that entrepreneurs are rare. It is not easy to get data on sufficiently large samples to allow careful statistical analysis. In consequence, much research has relied upon anecdotal evidence and ad hoc surveys.

Our object in this paper is to exploit a large random sample, the National Child Development Study, which provides detailed histories on all those born in Great Britain in the

week of the 3rd to 9th March 1958. Although the data allow us to examine the influence on self-employment of a whole range of variables, the particular concern of the paper is to test in the British context the liquidity constraint hypothesis proposed recently by US economists David Evans, Boyan Jovanovic and co-authors⁽¹⁾. Using American micro data, papers such as Evans and Leighton (1989) and Evans and Jovanovic (1989) conclude that imperfect credit markets constrain entrepreneurs. They base their judgement on econometric tests in which wealthier people are shown to be more likely, *ceteris paribus*, to switch from paid employment into self-employment.

This idea has practical significance. If potential entrepreneurs are held back largely by lack of capital, a government that wished to foster entrepreneurial behaviour could do so by giving subsidies or grants to these individuals. The paper provides what we believe to be the first British test of this hypothesis, and (somewhat against our expectations) finds strong evidence for the liquidity constraint hypothesis. The test itself is methodologically novel, because it uses data on gifts and inheritances. Studying the behaviour of those who are given money is presumably as close as the economist can get to a laboratory experiment in which some subjects are given capital while those in a control group are not. We find that those who received gifts or inheritances are more likely in 1981 to run their own business. This is true holding constant a group of personal, family and geographical characteristics. The effect is large and is not the result of offspring inheriting family businesses.

The paper also tests a number of hypotheses proposed in the small business literature (see, for example, Curran (1986) and Curran and Burrows (1988)). Is it the case that self-employment is more likely for those individuals

- a) unemployed in the past
- b) with a self-employed father
- c) who worked at part-time jobs while children
- d) living in areas of high unemployment?

We attempt to evaluate these and related questions.

The paper has the following structure. Section 1 sets out the theoretical background and Section 2 summarizes the features of the data set. The econometric findings are given in Section 3. Section 4 states the paper's conclusions.

Section 1. Theoretical Background

In this section we outline a conceptual framework for the analysis of self-employment. Consider a model in which individuals value "independence" in its own right. This assumes that a person's utility may depend upon the way in which income is earned and not just upon the level of income. Assume that individual i must choose a career either as a worker or as an entrepreneur. Entrepreneurs start businesses and employ those who choose to be workers. The latter earn wage w with certainty. The former, those who become self-employed, receive net income

$$y = \phi f(n) - wn - k \quad (1)$$

where ϕ is entrepreneurial ability, $f(n)$ is output, n is employment and k is capital. It is assumed that a given level of k is required to run a business (it could be thought of as an "office" or equivalent). Employment is chosen optimally.

The distribution of entrepreneurial ability in the population is taken to be $g(\phi)$. As in Kanbur (1982), individuals do not know their own ability until they set up in business. After that is revealed they earn income

$$y(w, k, \phi) = \max_n \phi f(n) - wn - k. \quad (2)$$

Individuals derive utility from two sources. One is from income; the other is from being their own boss. Without loss of generality, assume that people can be ordered by their desire for independence. Assume that expected utility for an entrepreneur is separable and may be written:

$$Eu = i + Ey \quad (3)$$

where E is the expectations operator, and i denotes the utility, for individual of type i , from being "independent" and having no boss. As a worker, however, individual i is taken to receive utility $u = w$. It is straightforward to generalize this approach to include risk-aversion.

Individual i chooses self-employment over wage-work if

$$i + \int y(w, k, \vartheta) g(\vartheta) d\vartheta \geq w. \quad (4)$$

When the non-pecuniary and (expected) pecuniary benefits from entrepreneurship are sufficiently high, the individual chooses to set up in business and to employ other individuals. Ex post, define a function $i = i(w, k, \vartheta)$, which captures the indifference locus given by the implicit function

$$i + y(w, k, \vartheta) - w = 0. \quad (5)$$

By differentiation,

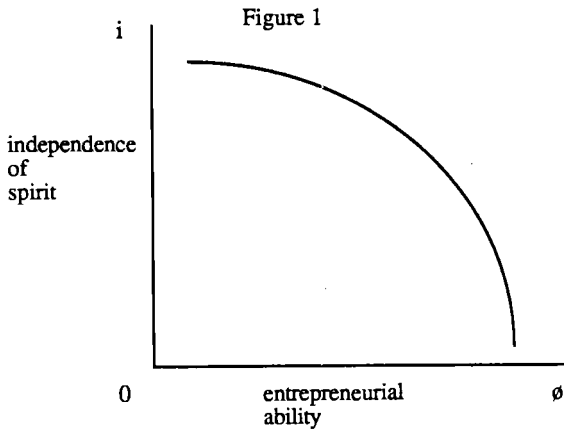
$$i_{\vartheta} = -f(n) < 0 \quad (6)$$

$$i_{\vartheta\vartheta} = -f'(n) \frac{\partial n}{\partial \vartheta} < 0. \quad (7)$$

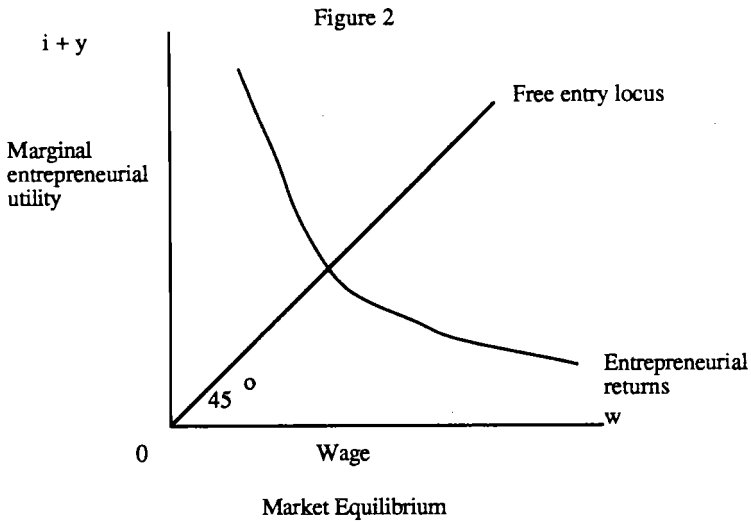
Hence there exists a concave relationship between the marginal level of entrepreneurial ability and the marginal level of utility from independence. This is sketched in Figure 1. The figure shows those combinations of independence of spirit (i) and business ability (ϑ) that make marginal entrepreneurs indifferent between self-employment and wage-work.

As Figure 1 illustrates, those individuals on the margin of becoming entrepreneurs can have different combinations of independence and ability. High-ability people need only a low desire for independence for it to be optimal for them to set up in business, and vice versa for low-ability entrepreneurs. Entrepreneurs need not earn more than workers: part of the return comes in non-pecuniary form.

It is interesting to consider the characteristics of market equilibrium in this model. First, free entry into entrepreneurship and wage-work requires that, at the margin, each offer the same utility. Second, it is movements in the wage which act to bring about overall equilibrium. If the wage rate is high, the returns to being an entrepreneur are low, so that individuals will be disinclined to set up business; they will move into wage-work, thereby putting downward pressure



Indifference Locus For The Marginal Entrepreneur



on wages. If the wage is low, entrepreneurial profits will be large, and the opposite flow will occur.

Labour market equilibrium can be characterized as in Figure 2. Free entry ensures that (unconstrained) equilibria lie on the 45° line. The other locus is downward-sloping because $y(w, k, \theta)$ is a declining function of the wage rate. At the equilibrium intersection, the level of workers' wages is just sufficient to equate the marginal entrepreneur's net return (pecuniary plus non-pecuniary) with his or her alternative income in wage-work. It is straightforward to show that

- i) a rise in entrepreneurial spirits (average values of i) in the economy reduces the average equilibrium financial return to self-employment and raises the wage, and
- ii) a rise in entrepreneurial ability (average values of θ) in the economy increases both the average equilibrium return to self-employment and the wage rate.

Although the model identifies theoretically the determinants of entrepreneurship, and suggests why they matter at the aggregate level, the aim must be to make the ideas operational.

Economists are far from an understanding of the market for entrepreneurs. The main purpose of this paper is the more limited one of trying to uncover the empirical counterparts of i and θ . Our data provide a rich set of possible variables.

Section 2. Data

The National Child Development Study is a longitudinal survey which takes as its subjects all those living in Great Britain who were born between the 3rd and 9th March 1958. The survey has been sponsored by five UK Government Departments - the Departments of Health and Social Security (DHSS), Education and Science (DES), Employment (DE), Environment (DOE) and the Manpower Services Commission (MSC). Since the original Peri-natal Mortality Study was undertaken in 1958, major surveys were also carried out in 1965 (NCDS1), 1969 (NCDS2), 1974 (NCDS3) and 1981 (NCDS4). For the purposes of the first three surveys, the birth cohort was augmented by including those new immigrants born in the relevant week, and information was obtained separately from parents, teachers, and doctors, as well as member of the NCDS cohort. The 1981 survey differs in that no attempt was made to include new immigrants since 1974 and

information was obtained only from the subject.

The 1981 survey contained a total of 12,537 interviews⁽²⁾, namely, approximately 76 percent of the original target sample and 93 percent of those traced and contacted by interviewers. The interview survey was carried out between August 1981 and March 1982. For further details of the surveys, see Elias and Blanchflower (1988, 1989).

The National Child Development Study reveals that in 1981 only a small percentage of twenty-three year olds were self-employed. Of the approximately 12,500 people on whom we have records, just over 500 were working full-time in self-employment, slightly under 100 were self-employed in a part-time capacity, while a further 100 individuals had been self-employed in their first or last job but were not working at the time of interview. Hence only one in twenty young people worked in a job which they had themselves created.

Table 1 provides the raw figures. We distinguish between individuals who:

- (i) were self-employed individuals, with assets, who employed others ('Assets and employees');
- (ii) were self-employed with employees but no assets (these two categories were combined because there were only twelve individuals in the second group);
- (iii) were self-employed at the time of interview and had assets but no employees ('Assets'): in the above definitions, 'assets' is taken to include property, machinery, vehicle stocks and materials;
- (iv) were self-employed with neither assets nor employees ('Neither assets nor employees');
- (v) were employees in their main activity but were also self-employed part-time ('Part-time');
- (vi) were not working at the time of interview but whose first and/or last job was self-employed ('First and last');
- (vii) were working or running a family firm.

The 'employee' category includes both full-time and part-time employees while the 'unemployed' category includes those awaiting a job, those who wanted a job and those who admitted they did not wish to work. Finally, the 'OLF' category includes those individuals who were sick, in prison, engaged in housework or on a long holiday.

The categories on the left hand side of Table 1 show the breakdown by economic status at

Table 1. Labour Market Status of Respondents to NCDS4

Status	Male	Female	% in family firm	No. of Observations
<u>Self-employed</u>				
Assets and employees	75	25	46	130
Assets	83	17	28	231
Neither assets nor employees	75	25	11	160
Part-time self-employed	60	40	*	94
First and last	69	31	18	113
<u>Other</u>				
Employee	55	45	-	8563
Unemployed	61	39	-	1158
OLF	6	94	-	1758
Education	65	35	-	298
No. of observations	6251	6254	158	12505

Notes: * No information available

the time of interview. Self-employment is the fourth largest category: it comes below that for employees (8,600), that for those out of the labour force (1,800) and that for the unemployed (1,200). The Table reveals that the self-employed are predominantly male.

In the empirical analysis that follows we restrict ourselves to individuals who were either employed or self-employed at the time of interview in 1981. This gives a sample size of 7,179 observations, of whom 7.2% were self-employed. Sample means and standard deviations of variable used in the following section are reported in Appendix A. Appendix B provides details of the variables.

Section 3. Results

Entrepreneurial activity is, of course, shaped by a multitude of forces. Using NCDS data, Payne (1984) and Blanchflower and Oswald (1988a, 1988b) identified a number of results using bivariate cross-tabulations. One object of our analysis is to employ multivariate methods to examine similar issues. In this paper the dependent variable is set to one if the individual is self-employed (two different definitions are used) and to zero otherwise.

Tables 2-5 present the econometric results from estimating probit equations⁽³⁾. Results for the greatest number of entrepreneurs -- those individuals who report any form of self-employment - are presented in Table 2. The Table includes, among other variables, the kinds of personal characteristics conventional from micro-econometric work. Thus gender and education, both affect the likelihood of entrepreneurial behaviour (as measured by self-employment status). Males and those individuals with 5 O-levels or 1 A-level are more likely than others to be self-employed. A person with children or a self-employed wife also has a higher probability. Health and race have no statistically significant impact⁽⁴⁾.

There is some evidence that spatial factors matter. People in East Anglia are the least likely to run their own businesses (followed by the East Midlands, which is not statistically significant at the 5% level). The county unemployment rate enters negatively in the equation, but has a t-statistic of only 1.8. This is weak evidence that high unemployment in the local area produces fewer entrepreneurs *ceteris paribus*. The evidence is stronger in subsequent Tables.

Table 2 Probit equation for all self-employed

VARIABLE	COEFFICIENT	ASYMPTOTIC S.E	ASYMPTOTIC T STAT
Fair health	0.135108	0.096374	1.401
Ever in a trade union	-0.473322	0.051716	-9.152
Male	0.472178	0.061631	7.661
Moved region	-0.257468	0.083738	-3.074
Children	0.203844	0.069347	2.939
Father manager (≥ 25)	0.037430	0.130575	0.286
Father manager (< 25)	0.153518	0.074351	2.064
Father unskilled	-0.235050	0.161306	-1.457
Father: farmer employer	0.945340	0.167018	5.660
Father: farmer own account	0.896971	0.197208	4.548
Weekday job term-time	-0.298511	0.168137	-1.775
Weekend & weekday job	0.146185	0.064823	2.255
Ever unemployed	-0.001135	0.057679	-0.019
Ever OLF	-0.132118	0.059080	-2.236
Wife: self-employed	0.418026	0.144936	2.884
Inheritance * 10^{-3}	0.116958	0.029223	4.002
Inheritance squared * 10^{-3}	-0.003794	0.001369	-2.771
Bet 5 time/week	-0.004037	0.166737	-0.024
Bet 3/4 times/week	-0.187507	0.211005	-0.888
Bet 1/2 times/week	-0.225233	0.067970	-3.313
Bet 2/3 times last 4 weeks	-0.117509	0.117274	-1.002
Bet 1 time last 4 weeks	-0.012022	0.123692	-0.097
In charge of others	0.201584	0.309578	0.651
Clean job	-0.168574	0.541283	-0.311
Little responsibility	0.389219	0.522025	0.745
Work with hands	0.479060	0.154301	3.104
Outdoor work	0.494797	0.134801	3.670
Good pay	0.180211	0.070907	2.541
Unforthcoming score	-0.026299	0.012525	-2.099
Hostility score	0.095098	0.036679	2.592
Acceptance anxiety score	-0.073817	0.036811	-2.005
White	0.002343	0.111403	0.021
Numeracy problems	-0.049772	0.300489	-0.165
Literacy problems	-0.145349	0.168314	-0.863
South West	-0.048448	0.105695	-0.458
Wales	-0.145243	0.158838	-0.914
West Midlands	-0.040831	0.126499	-0.322
East Midlands	-0.216893	0.128068	-1.693
East Anglia	-0.334912	0.161879	-2.068
Yorks & Humber	-0.031180	0.114813	-0.271
North West	-0.008573	0.127029	-0.067
North	-0.117886	0.155898	-0.756
Scotland	-0.122795	0.127230	-0.965
Greater London	-0.063353	0.086780	-0.730
Maths score when young	0.005044	0.003076	1.639
County unemployment rate	-0.285100	0.160241	-1.779
Higher degree	0.282695	0.360118	0.785
First degree	0.083337	0.109369	0.761

Teaching qualification	0.318097	0.330211	0.963
HND etc.	-0.154316	0.120602	-1.279
Nursing qualification	-0.699739	0.375841	-1.861
One A-level	0.187062	0.084157	2.222
5 O-levels +	0.157076	0.079280	1.981
1-4 O-levels	0.034783	0.178450	-0.194
1-4 O-levels + commercial	0.036409	0.085387	0.426
Clerical qualification	0.289018	0.191715	1.507
Apprenticeship	0.536420	0.157930	3.396
Other qualifications	-0.451365	0.234636	-1.923
Number of jobs since school	0.120741	0.014534	8.307
Constant	-1.323116	0.385482	-3.432

LIKELIHOOD RATIO TEST = 569.2495

NUMBER OF OBSERVATIONS = 7179

Table 3 Probit equation for all self-employed (restricted version).

VARIABLE	COEFFICIENT	ASYMPTOTIC S.E.	ASYMPTOTIC T STAT
Male	0.476664	0.051301	9.291
Father manager (≥ 25)	0.066172	0.122336	0.540
Father manager (< 25)	0.209133	0.069885	2.992
Father unskilled	-0.151043	0.136493	-1.106
Father: farmer employer	1.018356	0.159312	6.392
Father: farmer own account	1.079575	0.178435	6.050
Inheritance * 10^{-3}	0.117495	0.026979	4.355
Inheritance squared * 10^{-3}	-0.003734	0.001273	-2.933
Unforthcoming score	-0.027451	0.011556	-2.375
Hostility score	0.084251	0.032911	2.559
Acceptance anxiety score	-0.057058	0.032607	-1.749
Numeracy problems	0.188396	0.214335	0.878
Literacy problems	-0.061018	0.153331	-0.397
South West	-0.036575	0.095244	-0.384
Wales	-0.135506	0.144881	-0.935
West Midlands	-0.024393	0.113982	-0.214
East Midlands	-0.254905	0.114102	-2.234
East Anglia	-0.295979	0.141381	-2.093
Yorks & Humber	-0.035839	0.105105	-0.340
North West	-0.024510	0.113318	-0.216
North	-0.172656	0.140971	-1.224
Scotland	-0.090641	0.115684	-0.783
London	-0.111633	0.080937	-1.379
Maths score when young	-0.002867	0.002580	-1.111
County unemployment rate	-0.343677	0.142264	-2.415
White	-0.026661	0.100887	-0.264
Constant	-0.846824	0.338728	-2.500

LIKELIHOOD RATIO TEST = 248.2920

NUMBER OF OBSERVATIONS = 7179

The single most statistically significant influence is whether or not the individual has ever been a member of a trade union, which enters negatively. Various interpretations of this are possible. Our own would be that those who join unions are likely to be politically and psychologically antipathetic to the idea of setting up in business.

Two elements in Table 2 suggest that entrepreneurship is shaped in conflicting ways by a history of personal movement and upheaval. First, those who moved regions (1974-1981) were less likely, in our sample, to be self-employed. Second, the number of jobs since school is positively associated with the likelihood of self-employment (with a t-statistic of more than 8).

One of the advantages of the National Child Development Study is that it records psychological information about the individuals when they were children. Three variables emerge as especially useful predictors:

- i) unforthcomingness syndrome
- ii) hostility to children syndrome
- iii) anxiety for acceptance syndrome.

All were from reports provided by teachers when the respondents were seven years of age. Each is statistically significant, and they reveal together that the self-employed were less likely than average (as children) to be anxious for acceptance or unforthcoming, and more likely than average to show hostility to other children. We take this as evidence that psychological factors play a role in moulding the entrepreneurial drive.

In the 1981 survey the respondents were asked about what factors they believed to be important in any new job. The self-employed were more likely than others to say (i) the chance to work with one's hands, (ii) the opportunity to work outdoors and (iii) the ability to earn high pay.

Father's occupation in NCDS2 is a statistically significant variable. The likelihood an individual is self-employed is positively related to the father being a manager or a farmer, and negatively (though the t-statistic is only 1.46) to the father being unskilled.

Are entrepreneurs people who enjoy taking risks? This question has not been tested in the literature and can not be studied completely adequately here. However, data on the individual's

gambling behavior are available in the National Child Development Study. As Table 2 makes clear, betting is not more common among the self-employed. All of the betting variables enter negatively, and betting once or twice a week has a t-statistic greater than 3.

Another predictor of entrepreneurial drive is whether the individual worked while a child. The 3rd sweep of NCDS, in 1974, when the respondent was 16 years of age, contains information on the jobs held prior to leaving high school. Those who had both a weekend and weekday job at that time in their lives were more likely, as Table 2 shows, to be self-employed at age 23.

Of central importance to our analysis, and stimulated partly by the recent work of Evans and Jovanovic (1989) and Evans and Leighton (1989), is the issue of whether capital liquidity constraints are important in the starting of businesses. Our work attempts to provide a new test of this hypothesis. The variables 'Inheritance' and 'Inheritance squared' denote the level and square of the size of an inheritance received by the individual. The entered variable was the largest amount the family unit received as indicated in response to the question:

"Have you (or your husband/wife/partner) ever inherited or received as a gift from another person, money, property, or other goods to the value of £500 or more?"

Q. 9, p. 68, NCDS 4.

The two observations categorized as 'over £100,000' were coded as £200,000. The distribution of inheritances and/or gifts is given below:

Size of inheritance	% of sample	% self-employed	No. of observations
£0	88.5	6.0	6351
£500 - £999	4.6	6.7	328
£1000 - £1999	3.5	9.0	254
£2000 - £4999	2.1	13.9	151
£5000+	1.3	20.0	95

These raw data suggest a positive relationship between the size of inheritance and the incidence of self-employment.

Table 4 Probit equation for self-employed not in a family firm

VARIABLE	COEFFICIENT	ASYMPTOTIC S.E.	ASYMPTOTIC T STAT
Fair health	0.116399	0.101549	1.146
Ever in a trade union	-0.383189	0.054685	-7.007
Male	0.381433	0.065116	5.857
Moved region	-0.221120	0.088974	-2.485
Children	0.176741	0.073750	2.396
Father manager (≥ 25)	0.023435	0.138421	0.169
Father manager (< 25)	0.038114	0.081595	0.467
Father unskilled	-0.182651	0.163650	-1.116
Father: farmer employer	0.285912	0.192758	1.483
Father: farmer own account	-0.410769	0.403215	-1.018
Weekday job term-time	-0.262389	0.182330	-1.439
Weekend & weekday job	0.104894	0.070879	1.479
Ever unemployed	0.035932	0.061171	0.587
Ever OLF	-0.110150	0.062173	-1.771
Wife self-employed	0.283658	0.155818	1.820
Inheritance * 10 ⁻³	0.101623	0.042072	2.415
Inheritance squared * 10 ⁻³	-0.003752	0.002744	-1.367
Bet 5 time/week	0.074771	0.170595	0.438
Bet 3/4 times/week	-0.188810	0.229294	-0.823
Bet 1/2 times/week	-0.164164	0.071917	-2.282
Bet 2/3 times last 4 weeks	-0.032003	0.121185	-0.264
Bet 1 time last 4 weeks	-0.000041	0.129845	-0.000
In charge of others	0.315099	0.310829	1.013
Clean job	-0.060735	0.556847	-0.109
Little responsibility	0.419857	0.546853	0.767
Work with hands	0.507615	0.161253	3.147
Outdoor work	0.420845	0.148213	2.839
Good pay	0.211151	0.074523	2.833
Unforthcoming score	-0.021156	0.013497	-1.567
Hostility score	0.100746	0.037949	2.654
Acceptance anxiety score	-0.057057	0.038239	-1.492
White	0.030687	0.118720	0.258
Numeracy problems	0.031112	0.297687	0.104
Literacy problems	-0.110567	0.185620	-0.595
South West	-0.108270	0.110973	-0.975
Wales	-0.258561	0.170847	-1.513
West Midlands	-0.071816	0.137222	-0.523
East Midlands	-0.245585	0.139177	-1.764
East Anglia	-0.370106	0.175395	-2.110
Yorks & Humber	-0.036618	0.134743	-0.271
North	-0.162328	0.165437	-0.981
North West	-0.157704	0.137590	-1.146
London	-0.073756	0.090637	-0.813
Maths	0.005909	0.003305	1.787
County unemployment rate	-0.279951	0.172312	-1.624
Higher degree	0.459304	0.363931	1.262
First degree	0.194621	0.113676	1.712
Teaching qualification	0.378942	0.341484	1.109
HND etc	-0.153290	0.130938	-1.170

Nursing qualification	-0.610798	0.399549	-1.528
One A-level	0.202816	0.090784	2.234
5 O-levels	0.163634	0.083707	1.954
1-4 O-levels	-0.171809	0.211991	-0.810
1-4 O-levels + commercial	0.036353	0.091138	0.398
Clerical qualification	0.351060	0.203689	1.723
Apprenticeship	0.476934	0.174874	2.727
Other qualification	-0.340824	0.242503	-1.405
Number of jobs	0.134382	0.015443	8.701
Constant	-1.513637	0.413117	-3.663

LIKELIHOOD RATIO TEST 388.0127

NUMBER OF OBSERVATIONS = 7179

Table 5 Probit equation for self-employed not in a family firm (restricted version).

VARIABLE	COEFFICIENT	ASYMPTOTIC S.E.	ASYMPTOTIC T STAT
Male	0.401150	0.055001	7.293
Father manager (≥ 25)	0.048536	0.128034	0.379
Father manager (< 25)	0.084354	0.077250	1.091
Father unskilled	-0.101889	0.138275	-0.736
Father: farmer employer	0.338878	0.191727	1.767
Father: farmer own account	-0.054499	0.291305	-0.187
Inheritance * 10^{-3}	0.100788	0.039571	2.547
Inheritance squared * 10^{-3}	-0.003622	0.002558	-1.415
Unforthcoming score	-0.021083	0.012209	-1.726
Acceptance anxiety score	0.091120	0.033733	2.701
Hostility score	-0.036839	0.033920	-1.086
Literacy problems	0.012160	0.160230	0.075
South West	-0.110933	0.101376	-1.094
Wales	-0.254942	0.156150	-1.632
West Midlands	-0.061913	0.120759	-0.512
East Midlands	-0.284339	0.122942	-2.312
East Anglia	-0.336119	0.155429	-2.162
Yorks & Humber	-0.081102	0.110208	-0.735
North West	-0.056448	0.119630	-0.471
North	-0.214057	0.148785	-1.438
Scotland	-0.128236	0.123744	-1.036
London	-0.099432	0.082987	-1.198
Maths score when young	-0.001044	0.002784	-0.374
County unemployment rate	-0.321619	0.150957	-2.130
White	0.000289	0.105228	0.002
Constant	-0.961478	0.359667	-2.673

LIKELIHOOD RATIO TEST = .127.2568

NUMBER OF OBSERVATIONS = 7179

Both inheritance variables in Table 2 are statistically significant. Our results confirm the raw correlations found in Payne (1984). They show that the size of the inheritance enters a self-employment probit in a non-linear way. For inheritances up to £15,400 the probability of self-employment rises; beyond that it declines. It is notable that this concave structure is similar to that found, for family assets, in Evans and Jovanovic (1989) and Evans and Leighton (1989). Our evidence is consistent with their claim that

"the data point to liquidity constraints: capital is essential for starting a business and liquidity constraints tend to exclude those with insufficient funds at their disposal"

(p. 808, Evans and Jovanovic (1989)).

One possible objection to the finding is that inheritance could play an important role in entrepreneurship among the young merely because some individuals inherit family firms. Thus it is useful to check the conclusions on a sample which excludes individuals who are self-employed within a family business.

Table 4, which uses the dependent variable 'self-employed but not in a family firm', is similar to Table 2. In total, 158 of the 606 individuals in the data file who were self-employed reported that they worked in a family firm. This is made up of 46% of those with assets and employees, 28% of those with assets and no employees, and 11% with neither assets nor employees (see Table 1). Apart from a loss of precision on the squared inheritance term -- presumably because of the smaller mean of the dependent variable -- the only obvious difference is in the performance of the measures of father's occupation. Interestingly, the categories showing the father as a farmer behave differently from Tables 2 and 3. In particular, the variable for 'farmer: own account' goes from strongly positive to somewhat negative, which suggests that the coefficient picks up the inheritance of farms by offspring.

A substantive difficulty is that many of these variables can be viewed as endogenously determined with self-employment. Because identification is then problematic, we also estimated restricted versions in which only clearly predetermined regressors were included. The results are given in Tables 3 and 5. The restricted versions give almost identical results to Tables 2 and 4.

Table 6 The Probability of Being Self-Employed.Example 1

Size of Inheritance (£)	Probability
Zero	0.172
500	0.187
1000	0.203
2000	0.234
5000	0.324
7500	0.387
10000	0.438
20000	0.450
25000	0.347
50000	0.000

Hypothetical individual: *male, living in London, with a maths score of 30, who had 2 jobs since school, whose father was the manager of an enterprise employing more than 25 people, in an area with a local unemployment rate of 5%. All other variables were set to zero.*

Example 2

Size of Inheritance (£)	Probability
zero	0.061
500	0.068
1000	0.073
2000	0.087
5000	0.129
7500	0.160
10000	0.177
20000	0.161
25000	0.093
50000	0.000

Hypothetical individual: *male, living in the East Midlands, with a maths score of 18, father a skilled manual worker, who had 3 jobs since leaving school, in an area with a local unemployment rate of 7%. All other variables were set to zero.*

The coefficients on the inheritance variables, for example, are unaffected by moving to the restricted models.

To study the quantitative importance of inheritance we constructed a number of hypothetical cases, using the model estimated in Table 2, and calculated how the probability of self-employment varies with changes in the size of the inheritance. Table 6 gives the results of two typical outcomes. It shows that comparatively small increases in inheritance have large effects on the probability of running a business. Individuals who received £5,000 are approximately twice as likely to be self-employed than those who received nothing. The probability peaks at approximately £14,000 in Tables 2-5, and by £50,000 shrinks to zero.

Section 4. Conclusions

Entrepreneurship is one of the most elusive and least understood forms of economic behaviour. We have followed a small but growing literature by focusing on a particular type of entrepreneur -- the self-employed individual -- in an attempt to use microeconomic methods to discover what moulds those who start their own businesses. The data set is the National Child Development Study⁽⁵⁾, which provides longitudinal information on all Britons born in the week of the 3rd to the 9th March 1958.

What is it that makes a young entrepreneur? Our empirical analysis identifies many factors, but one stands out. These British data support the hypothesis -- recently examined by US economists -- that entrepreneurs face capital and liquidity constraints. It appears that the effect is large. The results suggest, for example, that a gift or inheritance of £5,000 approximately doubles a typical individual's probability of setting up his or her own business⁽⁶⁾.

The statistical analysis -- summarizing information on a heterogeneous group of entrepreneurs -- suggest also that individuals are more likely to be self-employed if they (i) are men, with children and a self-employed wife, (ii) have a father who was a manager of an enterprise employing less than 25 people or was a farmer, (iii) had, as a schoolchild, a weekend and weekday job, (iv) have never joined a trade union, (v) have never been out of the labour force, (vi) do not gamble, (vii) favour jobs 'with good pay' or 'working out of doors' or 'working with their

hands', (viii) were, as a child, hostile to others, but not unforthcoming or anxious for acceptance, (ix) live outside East Anglia, (x) have an educational level of four O-levels to one A-level, (xi) did an apprenticeship, (xii) had many jobs after leaving school, (xiii) and have not moved regions in the previous seven years. There is also some evidence that individuals are more likely to be self-employed if they live in an area of low unemployment.

The conclusion that capital and liquidity constraints are influential has implications for economic policy. Although any econometric result should be treated cautiously, the estimates in this paper are consistent with the idea that entrepreneurship can be fostered by financial grants, and they provide tentative information about the size of the response to different levels of such transfers. This should be of interest to any government which believes that Britain needs more entrepreneurs.

ENDNOTES

- (1) A detailed survey of the literature is given in the previous version of this paper, Blanchflower and Oswald (1990). The principal micro-econometric papers are Fuchs (1982), Rees and Shah (1986), Pickles and O'Farrell (1987), Borjas and Bronars (1989), Evans and Jovanovic (1989), Borjas (1986) and Evans and Leighton (1989). OECD (1986) and Blau (1987) are aggregate time-series studies.
- (2) Inevitably, given the long span of time over which NCDS has been collected, some of the individuals have dropped out of the survey. These youngsters either died, refused to respond, moved and were not traced, emigrated or were lost through administrative errors. There are reasons to believe that this attrition is not random (see Elias and Blanchflower (1989) for a discussion of this issue). Our current work is concerned with identifying the extent of any biases thus created. Although we are conscious of the weakness, this paper follows convention in ignoring the problems raised by attrition.
- (3) The list of variables is not precisely the same in each equation. This is because of matrix singularities occasionally generated by the relatively small means of some of the dependent variables.
- (4) These findings are similar to Rees and Shah (1986), who can also identify an age effect.
- (5) Few other economists have used the data set. Exceptions include Connolly, Micklewright and Nickell (1989) and Micklewright (1989).
- (6) Although not much can be done about it, one caveat ought to be recorded. It is possible that inheritance is a proxy for some other underlying variable. It could be, for example, that 'dynamic' parents produce 'dynamic' children and two of the characteristics of these individuals are that they are entrepreneurial and they tend to give financial help to their children. On this view there would be no case for a policy subsidising entrepreneurship, because entrepreneurial drive would depend upon genes. However, it is worth remembering that we have controlled for parental social class when the respondent was eleven (NCDS2), and for a range of individual ability and personality traits. In addition, we experimented with a large number of social class variables drawn from various sweeps of the surveys.

Appendix A

VARIABLE	MEAN	STD DEVIATION
<u>Independent Variables</u>		
Fair health	0.0715	0.2576
Ever in a trade union	0.6122	0.4872
Male	0.5611	0.4963
Moved region	0.1485	0.3556
Children	0.1403	0.3473
Father manager (≥ 25)	0.0387	0.1929
Father manager (< 25)	0.1110	0.3142
Father unskilled	0.0404	0.1969
Father: farmer employer	0.0107	0.1030
Father: farmer own account	0.0091	0.0947
Weekend job term-time	0.0333	0.1794
Weekend & weekday job	0.1585	0.3652
Unemployed ever	0.3764	0.4845
OLF ever	0.3324	0.4711
Wife self-employed	0.0244	0.1542
Inheritance * 10^{-3}	0.3296	3.3160
Inheritance squared * 10^{-3}	11.1042	493.7600
Bet 5 time/week	0.0206	0.1421
Bet 3/4 times/week	0.0201	0.1402
Bet 1/2 times/week	0.2403	0.4273
Bet 2/3 times last 4 weeks	0.0588	0.2352
Bet 1 time last 4 weeks	0.0497	0.2174
In charge of others	0.0071	0.0840
Clean job	0.0036	0.0601
Little responsibility	0.0033	0.0577
Work with hands	0.0167	0.1282
Outdoor work	0.0258	0.1584
Good pay	0.1358	0.3426
Unforthcoming score	1.6749	2.2291
Hostility score	0.2375	0.7333
Acceptance anxiety score	0.2992	0.7479
White	0.9391	0.2391
Numeracy problems	0.0109	0.1037
Literacy problems	0.0231	0.1503
South West	0.0786	0.2691
Wales	0.0528	0.2236
West Midlands	0.1007	0.3009
East Midlands	0.0705	0.2560
East Anglia	0.0387	0.1929
Yorks & Humber	0.0864	0.2809
North West	0.1006	0.3008
North	0.0585	0.2347
Scotland	0.0885	0.2840
London	0.1265	0.3324
Maths score when young	18.0375	10.0717
County unemployment rate	2.3990	0.2971
Higher degree	0.0026	0.0514
First degree	0.1018	0.3024

Teaching qualification	0.0068	0.0823
HND etc.	0.0678	0.2515
Nursing qualification	0.0265	0.1605
One A-level	0.1329	0.3395
5 O-levels	0.1555	0.3623
1-4 O-levels	0.0304	0.1716
1-4 O-levels + commercial	0.1556	0.3625
Clerical qualification	0.0167	0.1282
Apprenticeship	0.0162	0.1261
Other qualifications	0.0167	0.1282
Number of jobs since school	2.7139	1.8067

Dependent Variables

All self-employed	0.072	0.259
Not family firm	0.057	0.233

Appendix B

<i>Variable Definitions</i>	<i>NCDS</i>	<i>Description</i>
<u>Independent variables</u>		
Fair health	4	(1,0) dummy if respondent reported being in fair health
Ever in a trade union	4	(1,0) dummy if ever a member of a trade union
Male	4	(1,0) dummy if male
Moved region	3, 4	(1,0) dummy if moved regions between 1974 and 1980
Children	4	(1,0) dummy if respondent has any children
Father manager (≥ 25)	2P	(1,0) dummy if father manager in central, local government, industry, commerce (establishment employing 25 persons or over)
Father manager (< 25)	2P	(1,0) dummy if father manager in central, local government, industry, commerce (establishment employing under 25 people)
Father unskilled	2P	(1,0) dummy if father unskilled manual worker
Father: farmer employer	2P	(1,0) dummy if father farmer - employer
Father: farmer own account	2P	(1,0) dummy if father farmer - own account
Weekday job term-time	3	(1,0) dummy if had a weekday job only
Weekend & weekday job	3	(1,0) dummy if had a weekend and weekday job
Ever unemployed	4	(1,0) dummy if ever unemployed
Ever OLF	4	(1,0) dummy if ever out of the labour force
Wife: self-employed	4	(1,0) dummy if wife self-employed
Inheritance	4	value of inheritance received by respondent or their husband/wife/partner * 10 ⁻³
Bet 5 time/week	4	(1,0) dummy if played bingo, done the pools, gambled or placed bets of any kind 5 times a week or more
Bet 3/4 times/week	4	(1,0) dummy if played bingo, done the pools, gambled or placed bets of any kind 3/4 times a week or more
Bet 1/2 times/week	4	(1,0) dummy if played bingo, done the pools, gambled or placed bets of any kind 1/2 times a week or more
Bet 2/3 times last 4 weeks	4	(1,0) dummy if played bingo, done the pools, gambled or placed bets of any kind 2/3 times last 4 weeks
Bet 1 time last 4 weeks	4	(1,0) dummy if played bingo, done the pools, gambled or placed bets of any kind once in last 4 weeks
In charge of others	4	(1,0) dummy if respondent reported that the most important factor in choosing a job if they were looking for one now would be to have the chance of being in charge of others.
Clean job	4	(1,0) dummy if respondent reported that the most important factor in choosing a job if they were looking for one now would be to have a clean job
Little responsibility	4	(1,0) dummy if respondent reported that the most

		important factor in choosing a job if they were looking for one now would be to have little responsibility
Work with hands	4	(1,0) dummy if respondent reported that the most important factor in choosing a job if they were looking for one now would be to work with their hands
Outdoor work	4	(1,0) dummy if respondent reported that the most important factor in choosing a job if they were looking for one now would be to have outdoor work
Good pay	4	(1,0) dummy if respondent reported that the most important factor in choosing a job if they were looking for one now would be to have good pay
Unforthcoming score	1T	Unforthcoming score 0 = forthcoming
Hostility score	1T	Hostility to children score 0 = not hostile
Acceptance anxiety score	1T	Anxiety for acceptance by children score 0 = not anxious
White	1,2,3	(1,0) dummy if white #
Numeracy problems	4	(1,0) dummy if respondent has ever had numeracy problems
Literacy problems	4	(1,0) dummy if respondent has ever had literacy problems
South West	4	(1,0) dummy if located in the South West
Wales	4	(1,0) dummy if located in the Wales
West Midlands	4	(1,0) dummy if located in the West Midlands
East Midlands	4	(1,0) dummy if located in the East Midlands
East Anglia	4	(1,0) dummy if located in East Anglia
Yorks & Humber	4	(1,0) dummy if located in Yorks and Humber
North West	4	(1,0) dummy if located in the North West
North	4	(1,0) dummy if located in the North
Scotland	4	(1,0) dummy if located in Scotland
Greater London	4	(1,0) dummy if located in Greater London
Maths score when young	1,2,3E	result of a maths tests #
County unemployment rate	4	county unemployment rate in natural logarithms
Higher degree	4	(1,0) dummy if the respondent's highest qualification was a higher degree
First degree	4	(1,0) dummy if the respondent's highest qualification was a first degree
Teaching qualification	4	(1,0) dummy if the respondent's highest qualification was a teaching qualification
HND etc.	4	(1,0) dummy if the respondent's highest qualification was a HND/HNC or BEC/TEC Higher
Nursing qualification	4	(1,0) dummy if the respondent's highest qualification was a nursing qualification
One A-level	4	(1,0) dummy if the respondent's highest qualification was one A-level
5 O-levels +	4	(1,0) dummy if the respondent's highest qualification was 5 O-levels or more
1-4 O-levels	4	(1,0) dummy if the respondent's highest qualification was 1-4 O-levels
1-4 O-level + commercial	4	(1,0) dummy if the respondent's highest qualification was 1-4 O-levels and a commercial qualification
Clerical qualification	4	(1,0) dummy if the respondent's highest qualification was a clerical qualification

Apprenticeship	4	(1,0) dummy if the respondent's highest qualification was an apprenticeship
Other qualifications	4	(1,0) dummy if the respondent's highest qualification was an 'other' qualification
Number of jobs since school	4	number of jobs since leaving school
<u>Dependent variables</u>		
Self-employed	4	(1,0) dummy if the individual was self-employed in their main occupation or in a second job
Not family firm*	4	(1,0) dummy if the self-employed person did not work in a family firm

Notes: P = parental response
 T = teacher respons
 E = test(s) taken by respondent
 * = this information is not available on those who were self-employed in a second job
 # = for details on how the variable was constructed see Elias and Blanchflower (1989)

References

- Birch, D. (1979), The job generation process, MIT study on neighborhood and regional change, MIT Press, Cambridge, MA.
- Blanchflower, D. and Oswald A.J. (1988a), 'Entrepreneurship and self-employment in Britain', mimeo, Centre for Labour Economics, LSE.
- _____ (1988b), 'Work-history patterns of the young self-employed', mimeo, Centre for Labour Economics, LSE.
- _____ (1990), 'What makes a young entrepreneur?', Discussion Paper, Centre for Labour Economics, LSE.
- Blau, D. (1987), 'A time-series analysis of self-employment in the United States', Journal of Political Economy, 95, 3, pp. 445-467.
- Borjas, G. (1986), 'The self-employment experience of immigrants', Journal of Human Resources, 21, 4, pp. 485-506.
- Borjas, G. and Bronars, S. (1989), 'Consumer discrimination and self-employment', Journal of Political Economy, 97, 3, pp. 581-605.
- Connolly, S., Micklewright, J. and Nickell, S. J. (1989), 'The occupational success of young men who left school at sixteen', mimeo, Oxford.
- Curran R. (1986), Bolton fifteen years on: a review and analysis of small business research in Britain 1971-1986, Small Business Research Trust, London.
- _____ and Burrows, R. (1988), Enterprise in Britain: a national profile of small business owners and the self-employed, Small Business Research Trust, London.
- Elias, P. and Blanchflower, D. (1989), The occupations, earnings and work histories of young adults - who gets the good jobs?, Research Paper No. 68, Department of Employment, London.
- _____ (1987), 'Local labour market influences on early occupational attainment', in Unemployment, the regions and labour markets: reactions to recession, edited by I. Gordon, Pion Press, London.
- Evans, D. and Leighton, L. (1989), 'Some empirical aspects of entrepreneurship', American Economic Review, 79, pp. 519-535.
- _____ and Jovanovic, B. (1989), 'An estimated model of entrepreneurial choice under liquidity constraints', Journal of Political Economy, 97, 4, pp. 808-827.
- Fuchs, V (1982), 'Self-employment and labor force participation of older males', Journal of Human Resources, 17, 3, pp. 339-357.
- Goffee, R. and Scase R. (1987), Entrepreneurship in Europe. The social processes (eds.), Croom Helm, London.

- Kanbur, S.M.R. (1982), 'Entrepreneurial risk taking, inequality, and public policy: an application of inequality decomposition analysis to the general equilibrium effects of progressive taxation', Journal of Political Economy, 90, 1, pp. 1-21.
- Knight, F. (1921), Risk, uncertainty and profit, New York, Houghton Mifflin.
- Micklewright, J. (1989), 'Choice at sixteen', Economica, 56, pp. 25-40.
- Payne, J. (1984), 'Young self-employed workers', Employment Gazette, pp. 497-503.
- Pickles, A.R. and O'Farrell, P.N. (1987), 'An analysis of entrepreneurial behaviour from male work histories' Regional Studies, 21.5, pp. 425-444.
- Rees, H. and Shah, A. (1986), 'An empirical analysis of self-employment in the UK', Journal of Applied Econometrics, 1, pp. 95-108.