

# What Makes an Entrepreneur?

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## **Abstract**

The factors that affect the supply of entrepreneurs are important but poorly understood. We study a sample of individuals who choose either to be employees or to run their own businesses. Four conclusions emerge. First, consistent with the existence of borrowing constraints on potential entrepreneurs, we find that the probability of self-employment depends markedly upon whether the individual ever received an inheritance or gift. Second, when directly questioned in interview surveys, potential entrepreneurs say that raising capital is their principal problem. Third, consistent with our theoretical framework's predictions, the self-employed have higher levels of job and life satisfaction than employees. Fourth, childhood personality measurements and psychological test scores are of almost no help in predicting who runs their own business later in life. It is access to start-up capital that matters.

## What Makes An Entrepreneur?

*" 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 organizations to create wealth and accumulate capital. Indeed, according to many, economic recovery ... is largely dependent upon their ambitions and efforts."*

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

### 1. Introduction

Most Western governments provide encouragement and tax breaks to those who run small businesses. Politicians appear to believe that there are undesirable impediments to the market supply of entrepreneurship. Despite media and political interest in this topic, however, economists have contributed relatively little to the debate about how the economy generates successful small businesses. It has long been noted that economics textbooks largely ignore the role of the entrepreneur and say little about the formation of the small enterprises that provide the beginnings of giant corporations.

The simplest kind of entrepreneurship is self-employment. There is recent survey evidence to suggest that, in the industrialized countries, many individuals who are currently employees would prefer to be self-employed. Although it cannot be definitive, this evidence suggests that there may be restrictions on the supply of entrepreneurs. The International Social Survey Programme of 1989 asked random samples of individuals from eleven countries the question:

*"Suppose you were working and could choose between different kinds of jobs.*

*Which of the following would you choose?*

*I would choose ...*

*(i) Being an employee*

*(ii) Being self-employed*

*(iii) Can't choose."*

Large numbers of people gave answer (ii) and thus stated that they would wish to be self-employed. This answer was given by, for example, a remarkable 63% of Americans (out of 1453 asked), 48% of Britons (out of 1297), and 49% of Germans (out of 1575). These numbers can be compared with an actual proportion of self-employed people in these countries of approximately 15%.

The data raise a puzzle: why do not more of these individuals follow their apparent desire to run a business? This paper explores the factors that may be important in determining who becomes and remains an entrepreneur. After years of comparative neglect, research on the economics of entrepreneurship -- especially upon self-employment -- is beginning to expand. Microeconomic work includes Fuchs (1982) and Rees and Shah (1986), and more recently Pickles and O'Farrell (1987), Borjas and Bronars (1989), Evans and Jovanovic (1989), and Evans and Leighton (1989)<sup>(1)</sup>. This paper follows in the general spirit of these inquiries, although its data and methods differ from those in earlier investigations.

One possible impediment to entrepreneurship is lack of capital. In recent work using US micro data, Evans and Leighton (1989) and Evans and Jovanovic (1989) have argued formally that entrepreneurs face liquidity constraints. The authors use the National Longitudinal Survey of Young Men for 1966-1981 and the Current Population Surveys for 1968-1987. The key test shows that, all else equal, people with greater family assets are more likely to switch to self-employment from employment. This asset variable enters probit equations significantly and with a quadratic form. Although Evans and his collaborators draw the conclusion that capital and liquidity constraints bind, this claim is open to the objection that other interpretations of their correlation are feasible. One possibility, for example, is that inherently acquisitive individuals both start their own businesses and forego leisure

to build up family assets. In this case, there would be a correlation between family assets and movement into self-employment even if capital constraints did not exist. A second possibility is that the correlation between family assets and the movement to self-employment arises because children tend to inherit family firms.

The paper provides, in Section 4, a new test of the finance-constraint hypothesis. The test uses data on inheritances and gifts (as though from a 'natural experiment' in which some people enjoy windfalls while most do not). Studying the behavior of those who receive money is presumably as close as the economist can get to the ideal laboratory experiment in which some subjects are issued with capital while those in a control group get none. Results described later show that individuals who have received inheritances or gifts are more likely to run their own businesses. 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 enterprises.

The paper presents complementary questionnaire evidence. This is of a kind apparently not reported before in the literature. Data from interviews with random samples of individuals demonstrate that the self-employed say that they are constrained principally by a lack of capital. Moreover, many of those who are not self-employed say that it is predominantly a shortage of capital that prevents them from starting their own business. Section 5 contains this survey material. Although such survey responses have to be interpreted with caution, the message they provide is consistent with that from the quite different econometric methods.

Another theme within the paper is the role of psychological characteristics. The analysis studies the correlation between the probability of being self-employed as an adult and the individual's childhood scores on a number of psychological tests. Although originally a major motivation for the research, the results are relatively poor. Individuals' psychology -- at least using the data available here --

does not play a large role.

If it is true that capital and other constraints hold back the effective supply of entrepreneurship, and so lead to there being frustrated employees who would rather be entrepreneurs, those who run their own businesses might be expected to be 'happier', on average, than those who do not. In Section 6, the paper suggests and implements an econometric test of this hypothesis. It uses data of a kind more commonly studied by psychologists.

## 2. Theoretical Background

Consider the following theoretical model in which people choose between working in the entrepreneurial sector and being an employee. First, assume, following Knight (1921) and others, that entrepreneurial opportunities cannot be assigned probabilities. Second, assume that entrepreneurs may be constrained in the amount of capital they can directly acquire. Consider person  $j$ , who by assumption is a potential business-person with the vision to see a range of feasible business projects, and thus is within the intrinsically entrepreneurial section of the population. He or she needs capital to undertake a project. One possibility is to use own or family funds, thereby making it unnecessary to borrow commercially. However, person  $j$  may have lower savings than are required for the entrepreneurial venture. Then there is no option but to try to obtain a business loan.

A banker in the above framework is likely to reason in the following way. "I have little idea about whether project  $X$  will work out as Mr.  $A$  says. I cannot assign it a probability. However, if Mr.  $A$  offers me collateral of  $Y$ , then I can make a loan of  $Y - \delta$ , where  $\delta$  is the cost of reclaiming the collateral in the event of bankruptcy. This is effectively a risk-free loan." Thus secured ('collateralized') loans are a rational response by bankers to imperfect knowledge. Such a view provides a natural rationale for the existence of capital constraints.

Assume individual  $j$  can get an unsecured loan only  $z$  percent of the time,

where  $z$  is below unity. This is despite the fact that the business venture is assumed sound. The reason for the apparent sub-optimality is that individual  $j$  has no way of assuring the typical banker that the hypothetical project is feasible. He may do so (perhaps because some within the innovative entrepreneurial class become bankers), but not with certainty.

This approach makes genuine uncertainty a central feature of the analysis. By contrast, the recent work by Kanbur (1982), Khilstrom and Laffont (1979) and Grossman (1984) breaks with the tenets of earlier thought on entrepreneurial activity. Kanbur *et al* develop a standard neoclassical approach in which productive business opportunities are *ex ante* feasible for, and visible to, all individuals (most simply choose not to exploit them); there is an objective probability distribution governing business risk, and everyone knows that distribution; entrepreneurs receive the same expected utility as their workers; the entrepreneur is likely to be someone with unusually low risk-aversion (see especially Khilstrom and Laffont, 1979). These are different from the main assumptions and arguments of classic sources such as Schumpeter (1939), Knight (1921) and Kirzner (1973). In contrast to modern theory, the classic writings about the nature of the entrepreneur stressed the following: most individuals are not sufficiently alert or innovative to perceive business opportunities; there is no objective probability distribution governing business risks; an innovative entrepreneur may receive higher expected utility than he or she would as a regular worker; attitude to risk is not the central characteristic that determines who becomes an entrepreneur.

The paper's model draws upon the older, but recently neglected, current of thought. Eight assumptions are made.

**A.1** Assume that proportion  $\beta$  of the population has entrepreneurial vision. This group of individuals can see business opportunities where proportion  $1-\beta$  see none.

**A.2** There is, in the economy, an array of viable entrepreneurial projects, each of

which requires a different amount of capital,  $k$ . Each project requires only one entrepreneur's labor.

**A.3** The profit from project  $k$  (indexing in this way without loss of generality) is  $p(k)$ . This function describes the return from the different entrepreneurial ventures in the economy. Without loss of generality, it is assumed to be strictly increasing.

**A.4** There is a distribution of capital endowments across the population. Denote it  $f(k)$ , defined on support  $[0, 1]$ . The latter normalizes the richest person's assets at unity.

**A.5** An individual who perceives the array of business opportunities cannot with certainty borrow the required capital unless he or she has access to the necessary collateral. This is because, by their nature, such opportunities are not within the vision of most other kinds of individuals (such as bankers approached for loans). The individual can try to borrow for a project, but has only probability  $z$  of obtaining an unsecured loan<sup>(2)</sup>.

**A.6** Individuals receive utility

$$u = p + i \quad \text{in self-employment}$$

$$u = w \quad \text{in conventional employment,}$$

where  $w$  is the wage paid for non-entrepreneurial work, and  $i$  is the non-pecuniary utility from being independent and "one's own boss".

**A.7** Anyone can find alternative work at wage  $w$  in the non-entrepreneurial part of the economy. It is assumed that  $w$  equals the marginal product of labor in that alternative sector, and that this is a declining function,  $w(N)$ , of the number of employees in the sector,  $N$ .

**A.8** Population is normalized at unity. The number of entrepreneurs is  $E$ .

These assumptions lead to a simple but fairly unconventional model. To make the key points as simply as possible, all probabilistic business risk is assumed away. Many potential entrepreneurs are liquidity-constrained. People enter



entrepreneurship until, in equilibrium, either (i) capital or vision constraints are binding in aggregate or (ii) the utility from running a business is driven down to equal to that from wage-work. In the latter case,

$$w = p(k^*) + i, \quad (1)$$

where  $k^*$  is the amount of capital needed for the marginal entrepreneurial project. All projects requiring more capital have here already been undertaken.

The number of entrepreneurs in the economy is

$$E = \beta \int_{k^*}^1 f(k) dk + \beta z \int_0^{k^*} f(k) dk \quad (2)$$

$$= 1 - N \quad (3)$$

This is also, by the choice of units, the probability of self-employment for one individual. The first term on the right-hand side of equation (2) is the probability of 'vision' multiplied by the number of people with a greater capital endowment than  $k^*$  (that needed for the marginal project). The second term on the right-hand side of equation (2) is the probability of vision multiplied by the probability of successfully getting an unsecured business loan multiplied by the number of individuals who are short of capital.

Equilibrium in this economy can take two different forms. One is described by the simultaneous solution of equations (1) to (3). This is the case in which the market for entrepreneurs clears: the marginal entrepreneur earns utility (made up of profit plus the satisfaction from independence) equal to that from working in the wage-sector. There is a second possibility, and that is when there are insufficient entrepreneurs to drive to zero the surplus from running the marginal business. When there is a shortage of  $\beta$ -individuals with capital,

$$p(k^*) + i > w. \quad (4)$$

This distortion is a result of the asymmetric information between bankers and individuals with entrepreneurial vision.

A number of obvious comparative static results emerge.

Proposition 1

*When the market for entrepreneurs clears ( $p(k^*) + i = w$ ), the following raise the equilibrium number of entrepreneurs and the economy's wage rate:*

- (i) an increase in  $\beta$ , the proportion of the population with (entrepreneurial) vision*
- (ii) a rise in  $i$ , the utility from independence*
- (iii) an increase in  $z$ , the probability of loans to individuals without sufficient capital.*

Proposition 2

*When the market for entrepreneurs fails to clear ( $p(k^*) + i > w$ ), the following raise the equilibrium number of entrepreneurs and the economy's wage rate:*

- (i) an increase in  $\beta$ , the proportion of the population with entrepreneurial vision*
- (ii) an increase in  $z$ , the probability of loans to individuals without sufficient capital.*
- (iii) a drop in  $k^*$ , the binding level of capital necessary to set up a business*

*Contrary to the market clearing case, (iv) the utility from independence,  $i$ , has no effect.*

The proofs are omitted (they are given in an earlier version that is available on request from the authors).

The underlying idea is a simple one. At the individual level, there are capital constraints. Some of the people with the ability to see good projects fail to obtain the funds to undertake them; they do not have a large enough capital endowment,  $k$ , and are not lucky enough to get an unsecured loan. At the aggregate level, however, the capital constraint may not bind. This is the case analyzed in Proposition 1, where there is no distortion. The case in Proposition 2 is different. Here the supply of capital is so short that anyone who can raise the finance earns a form of rent created by the asymmetric information in the economy<sup>(3)</sup>.

In equilibrium, either capital or vision constraints are binding in aggregate, or the utility from running a business has been driven down to equal that from wage-work. In the former case  $w < p(e^*) + i$ , and in the latter  $w = p(e^*) + i$ . In a slight change of notation, for convenience, from capital levels to entrepreneurial projects,  $e^*$  is denoted as the marginal entrepreneurial venture. At  $e^*$ , all business projects with higher profitability (and higher capital) are already being undertaken.

Entrepreneurs are better off than regular workers, and the mean gap in utility between the two kinds of work is higher if there are fewer numbers of people with capital.

### Proposition 3

*Entrepreneurs get higher utility than regular workers.*

### Proposition 4

*When capital constraints bind, the larger is  $Z$ , the number of people in the economy who have capital, the smaller is the utility gap between entrepreneurs and workers.*

Proofs See Appendix.

This framework suggests two testable hypotheses. The first is the idea that some potential entrepreneurs are constrained, by lack of access to capital, to become employees rather entrepreneurs. The second is that individuals who run their own enterprises have higher utility than those who are employees in the wage-sector. Sections 3 and 4 study the first issue using an econometric test and complementary questionnaire evidence. The second issue is intrinsically more difficult to assess, because it requires data on utility levels in the two sectors. Following methods more commonly found in psychology than economics, Section 5 implements a test using reported satisfaction levels as proxy utility data.

### 3. Data and Methods

Whether or not individual  $j$  is self-employed depends on a joint probability

captured by the constituent parts of equation (1):

*the probability of running a business = (the probability of having entrepreneurial vision) \* (the probability of having capital + the probability of being able to get an unsecured loan given no capital).*

Empirically these probabilities may be assumed to depend upon a set of personal characteristics, especially measures correlated with the person's assets, and a set of regional and industrial characteristics. Rather than work with a highly structured model, the paper estimates reduced-form equations based on a linearization of the assumed probability function, and uses standard personal variables plus a range of childhood variables.

Should the analysis focus upon transitions into self-employment or upon cross-section evidence on those who are self-employed? Although it would be useful to have results for pure transitions into self-employment, there is a problem with such an approach. Policy-makers (as well as economists) are interested in entrepreneurs who are successful rather than unsuccessful, and in small businesses that last rather than fail. Therefore, showing that inheritances affect the flow into entrepreneurship would, in itself, be of limited (though positive) value, for it could be that such individuals quickly exit from self-employment. Establishing that a person's access to finance influences his or her decision to remain self-employed would, similarly, also be of positive but limited interest, because such people might be less likely to flow in to entrepreneurship in the first place.

A natural way to learn about the aggregate influence of capital injections such as inheritances is thus either (i) simultaneously to study both sets of transitions (in and out), or (ii) to study the effects of earlier inheritances upon the cross-section probability of being self-employed. This paper -- partly because of the nature of the data -- adopts the second approach. New work by Holtz-Eakin et al (1994a,b),

which follows an early version of this paper, takes route (i) and shows that inheritances both raise entry and slow exit.

The econometric analysis described in the next section draws upon the National Child Development Study (NCDS). This is a longitudinal birth cohort study that takes as its subjects all those living in Great Britain who were born between the 3rd and the 9th March, 1958. These children were surveyed at birth, and at ages 7, 11, 16, 23, and 33. At each of the first three follow-ups, information was obtained from parents, teachers, and doctors. At the most recent sweep, conducted in 1991 when all subjects were age 33, information was also gathered about the respondent's spouse and children. For details of the survey design, see Elias and Blanchflower (1989).

We make use of information about employment status that was collected in the interviews of 1981 (NCDS4) and 1991 (NCDS5). This has the useful feature that it provides snapshots of self-employment activity when the individuals were in their early twenties and early thirties. The 1981 sweep of NCDS contained 12,537 interviews. Of the total, 521 were self-employed, while 8657 worked as employees. Hence, approximately one in eighteen young people who were working at the time of interview had a job which they had, in a sense, created themselves. The 1991 sweep contains data on 11,407 individuals. Of these, 1279 were self-employed, while a further 7703 were employees. Thus, ten years further into the life cycle, the proportion of employment accounted for by the self-employed had risen from 5.7% in 1981 to 14.2% in 1991. The period itself probably accounts for some of this rise. In December 1981, there were 21,142,000 employees in employment in Great Britain, of whom 2,093,000 or 9.9% were self-employed. This compares with 21,506,000 employees in employment in December 1991, of whom 3,224,000 or 15% were self-employed (Source: Employment Gazette, January 1985, May 1994).

The empirical analysis focuses on individuals who were either employed or

self-employed at the time of interview in either 1981 or 1991. In each year, we study cross-section patterns at that point in time. This makes the nature of the equations different from Evans's work with Jovanovic and Leighton, where the data were on the flow into self-employment. The paper studies the probability that an individual reports himself or herself as self-employed. The dependent variable is therefore a stock rather than a flow, and so captures the combined effects of gifts and inheritances (among other variables) on past movements into and out of self-employment. However, some information is available on timing, and the later results do more than look at simple cross-section correlations.

To produce plausible evidence that an access-to-capital variable influences entrepreneurial activity, it is necessary to have a well-designed statistical test. It is likely to be important to be able to argue that the capital variable is exogenous or can be instrumented convincingly.

Two tests are done on 1981 data. One uses instrumental variables, the other lags. The data set has the valuable feature that it records in 1981 whether or not the entrepreneur's parents are alive or dead. A variable for parental death then makes a natural instrumental variable (in the NCDS data set, approximately 14% of individuals have at least one parent who has died), because it should enter an inheritance equation but not a self-employment equation. Unfortunately, this cannot be done in the 1991 data, because parental death is not available in the later data. In order to provide an additional test of the direction of causality, the paper also uses data on gifts/inheritances that were received many years before the start-up decision.

The key question in the NCDS surveys is:

*"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, NCDS4 and Q.E11, p.71, NCDS5.

This question was asked in both sweeps of the National Child Development Study. In 1981, 1060 working individuals responded positively to this question. These respondents were asked to report both the amount of the gift/inheritance and the date of its receipt. 6.4% of these monies were received before 1975, 25.7% between 1975 and 1978, and the rest received between 1979 and 1981. In the 1991 data, 2927 working individuals said they or their spouses had received a gift or inheritance of £500 or more. 80% of these inheritances or gifts had been received since 1981.

For analysis, these data on inheritance/gift payments were converted into constant 1981 pounds sterling by compounding the UK Treasury Bill interest rates from 1958-91. Among those who received a sum, the mean size of payment received by workers was £3617 in 1981 (with a standard deviation of £8421) and £5655 in 1991 (with a standard deviation of £18700). Only the largest inheritance/gift was recorded, so it is not possible to aggregate over any multiple gifts. It was thought best, for later analysis, not to exclude gifts received by married people's spouses before the marriage took place (because those spouses could have later used the money in their partner's business).

The distribution of inheritances or gifts in constant 1981 pounds is reported below from both NCDS4 and NCDS5. These raw data reveal a positive relationship between the size of inheritances/gifts and the incidence of self-employment. The first two columns of the distribution give the proportion of the employed and the self-employed who received an inheritance and/or a gift. The third column reports the proportion of individuals who were self-employed. In 1981:

NCDS4 - individuals aged 23 years

<i>Size of inheritance/gift</i>	<i>% of employed</i>	<i>% of self-</i>	<i>% of category</i>	<i>N</i>
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		<i>employed</i>	<i>self-employed</i>	
£0	88.7	83.8	5.3	8089
£500 - £999	3.5	2.7	4.4	319
£1000 - £1999	3.9	4.5	6.4	361
£2000 - £4999	2.3	3.3	7.8	219
£5000 - £9999	0.8	2.9	18.1	83
£10000 - £19999	0.5	1.8	18.4	49
£20000 and over	0.3	1.0	16.1	29

Ten years later the raw data look quite different, but the key correlation is still apparent. In 1991:

NCDS5 - individuals aged 33 years

<i>Size of inheritance/gift</i>	<i>% of employed</i>	<i>% of self-employed</i>	<i>% of category self-employed</i>	<i>N</i>
£0	72.6	71.0	14.0	8159
>£0 - £499	5.7	4.3	11.1	578
£500 - £999	5.9	4.8	11.9	600
£1000 - £1999	5.2	4.5	12.5	527
£2000 - £4999	4.9	6.2	17.3	530
£5000 - £9999	2.8	3.1	15.7	306
£10000 - £19999	1.6	2.8	22.4	203
£20000 - £49999	1.0	2.3	27.5	138
£50000 and over	0.4	1.0	33.3	45

All values here are in constant 1981 £.

#### 4. Self-Employment Probits Using NCDS Data

Tables 1 and 2 present the results from estimating self-employment probit equations when the respondents were aged 23 years. The independent variables include standard personal characteristics, regional variables, information on the father's occupation when the respondent was fourteen years old, and three variables



derived from personality reports from a school teacher when the respondent was seven years of age. These can be viewed as approximately pre-determined variables. Experimentation with a further set of possibly endogenous variables, such as marital status and educational qualifications, left the key results unaltered. Although they are not the focus of the paper, it is worth noting the negative effects of the local unemployment rate and the female dummy (replicating findings on a different UK data set in Blanchflower and Oswald, 1990b), the significant effects of father's occupation, and the borderline influence of childhood psychological traits. On the latter issue, many other psychological variables were tried unsuccessfully and hence were omitted.

As a test of the liquidity constraint hypothesis, the equation includes, sometimes as a quadratic function, a variable for the value of any inheritance or gift. The variables 'Inheritance/gift' and 'Inheritance/gift squared' denote the level and square of the size of the largest amount received by the individual

Column 1 of Table 1 reveals that, in the simplest linear specification, the inheritance variable is statistically significant at the five percent level. Column 2 suggests that the size of the inheritance enters a self-employment probit in a non-linear way, and this is confirmed in column 1 of Table 2, in which the sample is restricted to those who are not self-employed in family firms. The latter estimates are included as a check that the inheritance effect is not merely proxying the fact that children inherit family firms. For inheritances up to £21,200 in column 2 of Table 1, the probability of self-employment rises; beyond that it declines. This concave structure is similar to that found, for family assets, in Evans and Jovanovic (1989) and Evans and Leighton (1989).

It is possible that the Table 1 (columns 1 and 2) results might be contaminated by simultaneity bias, because children who are about to go into business may approach their own families for loans. Although the need to use

family money in this way could be construed as another example of capital constraints, two procedures were followed in an attempt to allow for the possible endogeneity of the inheritance/gift variable.

First, columns 3 and 4 of Table 1 report instrumental variable estimates. Here a good instrument is required, and the data set seems to contain one. The inheritance/gift variable is assumed to be a function of a variable for parental death. This ought to be an effective instrument because it should have no effect on the self-employment decision per se but should, and does, as would be expected, enter significantly into an equation for inheritance (details of the inheritance equations are not reported but are available from the authors). Approximately 14% of the sample had lost at least one parent in 1981. The exact figures in 1981 are:

	<i>Mother alive</i>	<i>Mother dead</i>
<i>Father alive</i>	10797	426
<i>Father dead</i>	1135	94

Second, to exploit a form of lag as an alternative to instrumenting, columns 2 and 3 of Table 2 use only data on those inheritances and gifts that came well before the self-employment decision. This approach attempts to establish causality, and so solve the potential simultaneity problem, by using a pre-determined inheritance/gift variable.

Reassuringly, both these methods confirm the role of inheritances/gifts in entrepreneurship equations, and so suggest that the evidence for effects from capital is not created by simultaneity bias. Columns 3 and 4 of Table 1, for example, report equations for self-employment where the size of any gift or inheritance is no longer treated as exogenous. There has been some research on the determinants of inheritance (for example, Cox (1987) and Wilhelm (1991)). Instrumenting the inheritance/gift variable using first OLS and then a Tobit gives, respectively, in columns 3 and 4 of Table 1, statistically significant results in the

self-employment probit equation. The coefficients and standard errors are, respectively, 0.023 (0.008) and 0.013 (0.006). More weight should probably be put on the second of these, because of the statistically preferable properties of the Tobit estimator (inheritances/gifts below £500 are reported as zeroes). In both of the specifications the quadratic form of the inheritance variable was weak and has been omitted; this raises doubts about the robustness of the previous estimate of the function's curvature.

Columns 2 and 3 of Table 2, which allow for timing and a recursive structure, lead to the same conclusion. When inheritances before 1978, or inheritances more than three years before self-employment, are used, there continues to be a statistically significant effect upon the probability of being self-employed in 1981. Here the quadratic terms are on the border of significance, so they are retained in columns 2 and 3. A three-year pre-inheritance interval was chosen as a compromise between the need for as long a lag as possible and the requirement that the number of observations not be too few.

The findings from these three sets of results -- uninstrumented, instrumented, and lagged -- all find statistically significant inheritance effects and are thus consistent with the existence of capital constraints. To study the quantitative importance of inheritance and gifts, a number of hypothetical cases were constructed, by using the model estimated in column 4 of Table 1 (results were similar if the estimates in column 2 were used instead). The results of two typical outcomes are reported below, with separate estimates for men and women.

Table 3 shows that comparatively small increases in inheritances/gifts apparently have large effects on the probability of running a business. Individuals who had received £5,000 (\$9,000) in constant 1981 pounds sterling were approximately twice as likely to be self-employed in 1981 as those who had received nothing. For example, a male in the South East of England, with an

apprenticeship and whose father was a manager in a workplace with under 25 employees, had a probability of 0.163 of being self-employed without an inheritance and/or a gift. This probability was 0.374 if he had received an inheritance of £5,000. In the case of females, the probabilities were 0.072 and 0.209, respectively.

Even though measured in 1981 pounds, the size of this effect appears remarkably large, especially when contrasted with the Evans-Jovanovic estimate that removing all liquidity constraints would increase the flow of entrepreneurs from 3.8% to 5.1% (p.824). The likely explanation -- apart from possible US and UK differences and the need for caution in interpreting all estimates in early work in a field -- is that capital constraints bind more on the young.

It might be argued that ideally age 23 is too young to study self-employed people. Tables 4 and 5 re-do the analysis for the 1991 data, that is, when these individuals were age 33. Table 4 is a probit equation for self-employment at that date. It is designed to be close in specification to the earlier Tables. Table 5 calculate a new set of probabilities.

Table 4 continues to find an apparently powerful correlation between self-employment status and having received an inheritance or gift. The sample consists of individuals in employment at the time of interview in 1991 when the respondents were thirty-three years of age. As in Tables 1 and 2, the dependent variable is set to 1 if self-employed in the main activity, and to zero otherwise. The self-employed were only slightly more likely to have received an inheritance than the employed (29% compared with 27.4% respectively), but the amount received was higher (the mean level of inheritance received was £4692 for the employed and £11148 for the self-employed).

Column 1 of Table 4 is a probit equation that includes only the amount of inheritance in constant 1981 pounds. The level of inheritance enters with a coefficient of  $0.85 \cdot 10^{-5}$  and a t-statistic of nearly 5. This is not a small effect

(given the amount of variation in the data). In column 2, there is some evidence that the relationship is a quadratic, as found earlier at age 23. The inheritance effect is robust to the inclusion of parental class variables in column 3. These variables work very similarly to those in Tables 1 and 2 above. The squared inheritance term is insignificant when parental social class is controlled for in column 4. It never achieves significance once other controls are included; hence in subsequent specifications in this Table it is omitted. To check for the possibility of attrition bias, column 5 and onward uses a bigger sample: it includes all those cases that had missing values to the parental class variable. We set all of the other social class dummies to zero for such cases and include a further dummy variable "Father: social class missing NCDS2". This is everywhere insignificant, and the other coefficients are essentially unchanged, which may suggest that these results are not biased by attrition.

The inheritance variable is robust to the inclusion of regional dummies (column 7), or the regional unemployment rate (column 8), which once again enters negatively. Column 9 of Table 4 includes the three personality scores provided by the school teacher when the respondent was aged seven. Those anxious for acceptance as children are less likely, at age 33, to be self-employed. Finally, in column 10, a form of lagged dependent variable is included. It records self-employment status in the earlier sweep of the NCDS survey, namely, in 1981. Even controlling for this, inheritance continues to be significant, and to be of approximately the same size.

Table 5 is the equivalent, for 33-year olds, of Table 3. Here the change in the probability in self-employment that an inheritance induces is smaller than at age 23. An inheritance of twenty five thousand pounds, for example, now raises the probability a few percentage points.

As usual with econometric analysis, it is not possible to rule out the

possibility that the observed empirical correlation is due to some other effect. Perhaps wealth makes people less risk-averse and thus more prone to go into business, or self-employment allows wealthier individuals to consume leisure more easily. Yet the apparently sizable effects from small inheritances do not make such an interpretation look the most natural one. As the next section shows, moreover, there is other evidence.

### 5. Interview Evidence on Capital Constraints

This part of the paper reports new survey findings -- from two other data sets -- that are consistent with the idea that both current and potential self-employed business owners feel constrained by limited capital. Its aim is to provide evidence that is more direct than, and complementary to, that in Evans and Jovanovic (1989) and Evans and Leighton (1989) and the econometric evidence reported in the previous section. Two previously unexploited sources of information are used. The first is the British Social Attitudes (BSA) Survey series, an annual random sample providing data from 1983 to 1989. The second is a 1987 government-sponsored random survey, the National Survey of the Self-Employed (NSS).

The BSA survey asked 5947 randomly chosen employees who had not been self-employed in the previous five years (97.1% of all employees) the question "How seriously have you considered being self-employed?". The answers are given in Table 6. On average, 16.8 per cent had considered running their own business either 'very seriously' or 'quite seriously'. In 1983, 1984 and 1986 a sub-sample of 451 respondents who had considered it very or quite seriously were asked the follow-up question: "Why did you not become self-employed?". The answers, which were recorded in their own words, are reported in Table 7. The Table reveals that, aggregating over the years, approximately half the group gave as their reason for not setting up in business that they could not obtain the necessary capital. It was the most common reason. This is one form of evidence on the

relevance of binding liquidity constraints.

The National Survey of the Self-Employed, which apparently has not been used before by economists, draws on information from a random sample of approximately 12,000 adults interviewed in Britain in the spring of 1987. Individuals who were recently self-employed were asked to name the main source of finance used to set up their business. Out of the 243 respondents<sup>(4)</sup> who were in this special category, 103 or 42% reported that they used their own savings to set up the business, 36 or 15% used money from family or friends, while only 41 or 17% took a bank loan. Taking this group as the base, Table 8 provides the answers to the question "What help would have been most useful to you in setting up your business?". It reveals that assistance with money and finance was the most commonly mentioned item, which is again consistent with the capital-constraint hypothesis.

In addition to interviewing the self-employed, the NSS also obtained information on 139 individuals who said they were 'seriously intending' to become self-employed. They were asked the following: "There are many anxieties and concerns people have in setting-up in self-employment. What are you most concerned about?". They were then given a list of twenty possible answers from which they had to select one. The main responses are reported in Table 9 and show that the single most common answer was that individuals were worried about how to raise the necessary finance.

These two questionnaire surveys provide information about the problems that potential and current self-employed people think are most important. In each case, the dominant answer concerns the availability of capital. Although economists are schooled to be cautious of survey information, it seems unlikely that there is nothing to be learned from this common message from different surveys. They appear to sit comfortably alongside the estimation results.

## 6. Testing Whether the Self-Employed Are Happier

The model implies (Proposition 3) that those running their own enterprises will be happier than employees. For a test of this, it is necessary to compare the total returns to conventional work and entrepreneurial activity. The reported earnings of self-employed individuals are known to be unreliable, and it is likely, as the model suggests, that such individuals get a non-pecuniary benefit from being their own boss. Hence, some proxy for overall utility is required.

This paper follows the psychology literature in using survey data on job and life satisfaction. It is established there (see, for example, Argyle 1989 and Warr 1985) that reported satisfaction numbers are highly correlated with observable measures of individual well-being such as quitting behavior and physiological symptoms. The small economics literature includes Hamermesh (1977), Borjas (1979), Freeman (1978), Meng (1990), Miller (1990), Schwochau (1987), Clark and Oswald (1992, 1994), and Blanchflower and Freeman (1994).

The central issue is whether, *ceteris paribus*, the self-employed report higher levels of overall utility or job satisfaction than do employees. After asking each 23-year-old individual how satisfied they were with a range of items, such as pay and working conditions, the following encompassing question was asked:

*"Taking everything into consideration, how satisfied or dissatisfied are you with your job as a whole"*

Q19j, p.9: NCDS4 questionnaire

Preliminary questions were asked about individual components of utility. Respondents presumably saw this question as requesting information on their entire 'utility package', and this makes the answers potentially useful.

The responses to the satisfaction question were coded into five categories. A cross-tabulation of the results is reported in Table 10. In so far as the responses can be seen as a genuine proxy for utility levels, they appear to favor the view that



the self-employed are 'happier'. The Table shows that 46% of the self-employed say that they are in the top category of very satisfied, whereas the figure is 29% for employees.

To control for other characteristics, ordered probit equations are estimated in Table 11. Because satisfaction is presumably influenced by income, some stance must be taken on whether or not a earnings measure is to be included in the probit equations. The theory makes clear that the appropriate test is to omit earnings variables. This is because the focus of interest is the total utility of individuals -- to allow a comparison of the entire utility associated with each kind of work -- and not just the satisfaction level after income is held constant.

Included as controls in the equations are dummy or continuous variables for self-employment, union membership, marital status, gender, disabled status, region, highest educational qualification, part-time, ever unemployed in the previous 5 years, a dummy for problems with arithmetic, months of experience, and job tenure. Month-of-interview dummies are included. A set of industry dummies are also included in Table 11. Results are also given for sub-samples of people who did and did not inherit money. These form the second and third columns of the Table.

It is apparent that the self-employment dummy variable is significant (it was so in all specifications, including those with few control variables). Consistent with the cross-tabulations presented in Table 10, self-employment has a positive effect on reported satisfaction levels (one that is quantitatively larger than any of the other dummies). As the equations exclude income measures, the self-employment variables are not capturing merely the non-monetary return to being one's own boss, but rather a mixture of money and other things. Given the paucity of work with data like these, the other controls may also be of interest. Women are more satisfied; married people are also more satisfied. Those who have been unemployed are less satisfied. Union members are also less content: this replicates

the main finding of the earlier literature of Borjas (1979) and Freeman (1978). Low qualifications and being part-time are also positively associated with satisfaction -- perhaps reflecting the low-aspiration effects discussed in Clark and Oswald (1992).

As an experiment into the effects of access to capital, the data were split into two sub-samples. The second set of columns of Table 11 is estimated with data on the 6887 people who reported themselves as having received no inheritance or gift of money or goods exceeding £500. The third set of columns of Table 11 gives estimates for the sub-sample of 987 people who had received this kind of inheritance or gift. There is some evidence that the self-employment dummy variable has a smaller effect in the group who inherited; the dummy even goes negative. Such evidence might be taken to be consistent with the idea that those with capital -- through an inheritance -- are more able to enter the self-employment sector and drive down the rents available there. This argument can only be suggestive, but indicates an area where further research may be fruitful.

Table 12 presents results for the 1991 data. Here there is no question asked about individuals' satisfaction with their work, so instead the dependent variable is the answers to a question about life satisfaction. The question asked was as follows:

*'Here is a scale from 0 to 10. On it, "0" means that you are completely dissatisfied and "10" that you are completely satisfied. Please ring one number to show just how dissatisfied or satisfied you are about the way your life has turned out so far.'*

Q8, p19, Section I, NCDS5  
questionnaire .

In the life satisfaction equation, a self-employment dummy enters positively<sup>(5)</sup>. Females and married people are significantly more satisfied. The union dummy here enters positively, suggesting that such people are happier even if (see the earlier Table 11) they may be less satisfied with their job. It is difficult to know what to

make of this difference. Columns 1 to 6 build up to a specification including personal and regional variables. Crucially for this paper, the finding that the self-employed are happier appears to be robust.

The results provide some evidence that entrepreneurs get higher utility than conventional employees. One caveat should be borne in mind when interpreting the paper's findings. The use of satisfaction and happiness data to proxy utility levels is unconventional in economics research. It may be that reported satisfaction levels are subject to important biases: self-employed people may be intrinsically more optimistic and cheerful than others, or feel psychologically compelled, because their business is in their own hands, to answer in the way they do. Nevertheless, at this juncture a more natural interpretation of the data is that the self-employed really are happier.

## 7. Conclusions

The forces that affect the supply of entrepreneurship are widely viewed as important but poorly understood. This paper uses survey and microeconomic methods to study a simple class of entrepreneurs, namely, individuals who run their own businesses. It draws upon data from the National Child Development Study, the British Social Attitude Surveys, the International Social Survey Programme, the US General Social Surveys, and the National Survey of the Self-Employed.

The empirical results are consistent with the hypothesis that entrepreneurs face finance and liquidity constraints. In an ideal world, this would be studied by constructing a laboratory or field experiment. In that experiment, the behavior of a group of individuals who are randomly given capital would be compared with the behavior of those from a control group who receive nothing. Such an approach is not probably not feasible in a subject like economics. But a natural experiment, in the same spirit, is generated by the fact that some individuals serendipitously receive inheritances and gifts.

The first part of the paper constructs a theoretical model in which capital-constrained individuals choose between employment and self-employment. Consistent with this, the empirical analysis produces four main conclusions.

1. The receipt of an inheritance or gift seems to increase a typical individual's probability, *ceteris paribus*, of being self-employed. This emerges from NCDS data. It is not an estimate of the effect of capital availability upon transitions<sup>(6)</sup> into self-employment, but rather -- and perhaps more relevant to policy -- an estimate of the lasting effect upon the stock of people running their own businesses. The inheritance effect is found both at age 23 and at age 33. It is especially large among the younger group (perhaps because older people have other ways to acquire capital).
2. Consistent with the model developed in the paper, ISSP data reveal that surprisingly large numbers of people in the industrialized countries say they would prefer to be self-employed, and NCDS data demonstrate that those who are self-employed report themselves as more satisfied, *ceteris paribus*, than employees. Complementary international evidence about the happiness of the self-employed is reported in Appendix D.
3. Faced with the question 'Why did you not become self-employed?', the most common survey response given by a random sample of workers in the BSA survey was to cite shortage of capital and money.
4. NSS data indicate that most small businesses were begun not with bank loans but with own or family money, that individual entrepreneurs felt they had needed most help with finance, and that the single biggest concern of potential entrepreneurs was with where to obtain capital.

When this research began, a key motivation was to study the impact of psychological traits on entrepreneurship. The NCDS data series seems ideally suited for this task, because it records the outcome of psychological tests that were

done during childhood. In practice, only one clear result can be found. Although the effect is quantitatively small, those who were anxious for acceptance (when children) were less likely to run their own businesses at age 33. Using the variables available here, in other words, psychology apparently does not play a key role in determining who becomes an entrepreneur.

The paper's results draw upon a variety of complementary methods and data sets. They are consistent with the view that capital constraints hold back potential entrepreneurs and that the self-employed earn a utility premium. The complex normative implications of these findings seem to demand attention.

Endnotes

1. OECD (1986) and Blau (1987) are aggregate time-series studies. Theoretical analysis relevant to this paper's results includes Rosen (1983), Shorrocks (1988), Casson (1990) and Holmes and Schmitz (1990). New empirical papers include Blanchflower and Meyer (1994), De Witt and Van Winden (1990), Holmes and Schmitz (1991), Lentz and Laband (1990), Meyer (1990), Reid and Jacobsen (1988), and Reid (1990). Unpublished work by Black and de Meza (1992) finds, consistent with the general tenor of the approach taken here, that housing equity plays an important role in shaping the supply of entrepreneurs.
2. An interesting but complex project would be to construct a complete theory of the determinants of  $z$  (the probability that someone with a good idea can obtain a loan from bankers who cannot themselves perceive the business opportunity). This paper requires only that  $z$  be less than unity.
3. It is assumed that the existence of any specialist venture-capital companies is not sufficient to remove the distortion created by asymmetric information.
4. Data sets covering newly self-employed entrepreneurs are almost inevitably small, so the best that can be done is to insist that data are drawn from a well-designed random sample.
5. We have replicated this positive self-employment result in happiness equations for eight other Western countries (Great Britain, Northern Ireland, USA, Italy, Eire, Israel, Norway West Germany and New Zealand) using ISSP data for 1991 and for the USA using a time-series of cross-sections from General Social Surveys, 1972-1990. Appendix Tables D1 and D2 report the exact questions asked, the distribution of responses as well as ordered probits equations for happiness. In both cases self-employment has a significant positive effect. Clark and Oswald (1994), using a medical measure of psychiatric health, uncover a somewhat different result, namely, that the self-employed are more highly stressed than are employees.
6. The usual reason that economists favor studies of transitions is because a cross-section typically does not provide data on the timing of events. This reason is inapplicable here: Table 2 gives estimates using inheritances/gifts that were received well before self-employment.

Table 1. Probit Equations for Self-Employment (N=6884): Age 23 in 1981.

	(1)	(2)	(3)	(4)	(5)
			<i>IV</i>	<i>IV/Tobit</i>	<i>Means</i>
Inheritance/gift * 10 <sup>2</sup>	.0012 (.0006)	.0089 (.0023)	.0228 (.0084)	.0131 (.0061)	378.21
Inheritance/gift squared * 10 <sup>6</sup>		-.0021 (.0009)			
Unforthcoming score	-.0235 (.0126)	-.0235 (.0126)	-.0238 (.0126)	-.0233 (.0126)	1.6588
Hostility score	.0251 (.0176)	.0251 (.0176)	.0267 (.0176)	.0264 (.0176)	.6658
Acceptance anxiety score	-.0258 (.0355)	-.0265 (.0356)	-.0268 (.0356)	-.0278 (.0358)	.2994
Apprenticeship	.2596 (.0621)	.2668 (.0623)	.2657 (.0623)	.2627 (.0622)	.1784
Father manager employing < 25	.2828 (.0726)	.2659 (.0730)	.2336 (.0748)	.2366 (.0759)	.1209
Father own account worker	.3228 (.1223)	.3142 (.1225)	.2900 (.1229)	.3028 (.1227)	.0341
Father: farmer employer	1.1002 (.1661)	1.0728 (.1681)	.6790 (.2327)	.9509 (.1840)	.0108
Father: farmer own account	1.2283 (.1700)	1.2341 (.1700)	1.2419 (.1703)	1.2095 (.1704)	.0098
Father: agricultural worker	.3574 (.2006)	.3700 (.2007)	.4148 (.2020)	.3927 (.2017)	.0131
Female	-.4672 (.0606)	-.4732 (.0609)	-.4900 (.0614)	-.4864 (.0615)	.4425
Log county unemployment rate	-.3259 (.1566)	-.3131 (.1567)	-.3077 (.1564)	-.3132 (.1563)	2.4032
Constant	-.9012 (.4127)	-.9479 (.4142)	-.981 (.4148)	-.9864 (.4151)	
Log Likelihood	-1363.8	-1355.6	-1362.0	1363.3	
Chi-square statistic	246.5	262.9	250.2	247.7	

Notes Ten regional dummies are included. Standard errors are in parentheses. Columns 1 and 2 have no instrumenting. Column 3 instruments the inheritance variable using an OLS inheritance equation. Column 4 instruments the inheritance variable using a Tobit inheritance equation. In each case the variables included in the instrumenting equation are mother/father/both dead, county unemployment rate, 10 region dummies, gender, married, and 15 dummies for father's social class.

Source: National Child Development Study, 1981

Table 2. Self-Employment Probit Equations Controlling for the Nature of Firm and Inheritance: Age 23 in 1981

	(1)	(2)	(3)
	Not family firm	Inheritance/gift before 1978	Inheritance/gift = 3 years prior self-emp.
Inheritance/gift * 10 <sup>2</sup>	.0101 (.0032)	.0180 (.0057)	.0182 (.0079)
Inheritance/gift squared * 10 <sup>6</sup>	-.0035 (.0017)	-.0084 (.0039)	-.0073 (.0054)
Unforthcoming score	-.0198 (.0137)	-.0274 (.0135)	-.0298 (.0136)
Hostility score	.0374 (.0181)	.0377 (.0182)	.0357 (.0184)
Acceptance anxiety score	-.0216 (.0379)	-.0511 (.0386)	-.0472 (.0388)
Apprenticeship	.2796 (.0671)	.2461 (.0660)	.2715 (.0665)
Father manager employing < 25	.1277 (.0828)	.3016 (.0779)	.3030 (.0789)
Father own account worker	.2593 (.1329)	.3106 (.1318)	.3234 (.1325)
Father: farmer employer	.4292 (.2491)	1.0636 (.1848)	1.0580 (.1886)
Father: farmer own account	.3129 (.2964)	1.2834 (.1809)	1.3406 (.1833)
Father: agricultural worker	.3842 (.2129)	.3897 (.2033)	.3993 (.2034)
Female	-.4349 (.0664)	-.4865 (.0650)	-.4747 (.0650)
Log county unemployment rate	-.2975 (.1650)	-.3726 (.1661)	-.3382 (.1703)
Constant	-1.0829 (.4503)	-.7236 (.4339)	-.8150 (.4378)
Log Likelihood	-1121.8	-1200.3	1174.8
Chi-square statistic	152.6	242.0	238.4
N	6788	6266	6187

Notes Ten regional dummies are included. Standard errors are in parentheses. These equations are not instrumented. Column 1 is for a sub-sample of entrepreneurs who did not work in family firms. Column 2's inheritance variable is for gifts and inheritances received prior to 1978. Column 3's inheritance variable is for gifts and inheritances received at least three years prior to entering self-



employment.

Source: National Child Development Study, 1981

Table 3. Probability (%) of Being Self-Employed at 23 by Size of Inheritance/Gift: Two Types of Individuals

	(1)	(2)	(3)	(4)
	Males	Females	Males	Females
Zero	16.3	7.2	3.3	1.0
£500	18.1	8.0	3.8	1.2
£1000	20.0	9.2	4.4	1.4
£5000	37.4	20.9	11.7	3.7

Columns 1 and 2 relate to a typical individual who lives in the South East, unemployment rate of 8.7%, father manager with < 25 employees, has an apprenticeship, personality scores set to means, all remaining variables set to zero.

Columns 3 and 4 relate to a typical individual who lives in Scotland, unemployment rate of 14%, personality scores set to means, all remaining variables set to zero.

All estimates are derived using the coefficients in column 4 of Table 1.

Source: National Child Development Study, 1981



Constant	-.5877	-.5921	-.7052	-.7095	-.6877	-.6949	-.9037	.2654	-.8597	-1.2191
	(11.66)	(11.73)	(6.89)	(6.91)	(6.86)	(6.91)	(6.99)	(0.98)	(6.32)	(7.14)
Log likelihood	-3511.82	-3510.36	-2900.20	-2900.02	-3468.41	-3467.71	-3419.20	-3440.30	-3030.03	-2162.18
$\chi^2$	137.61	140.51	187.40	187.76	223.82	225.21	279.66	237.46	259.74	649.36
Number of observations	8757	8757	7322	7322	8755	8755	8710	8710	7760	5998

Table 5. Probability (%) of Being Self-Employed at Age 33 by Size of Inheritance/Gift, 1991: Two Types of Individuals

	Male (1)	Female (2)	Male (3)	Female (4)
Zero	32.4	20.9	15.4	8.4
£25000	37.4	24.8	18.7	10.6

Columns 1 and 2 relate to a typical individual who lives in the South East, whose father was a manager with <25 employees, with the personality scores set to their means. Columns 3 and 4 relate to a typical individual who lives in Scotland, whose father was a manager with >25 employees, with the personality scores set to their means.

All estimates are derived using the coefficients in column 9 of Table 4.

Source: National Child Development Study, 1991

Table 6. How Seriously Have You Considered Becoming Self-Employed? (%)

	Very seriously	Quite seriously	Not very seriously	Not at all seriously	N
1983	5.3	11.9	12.6	70.2	779
1984	6.6	10.3	12.3	70.7	724
1986	6.1	9.5	14.2	69.9	1470
1987	4.9	9.7	14.0	71.4	1273
1989	5.9	9.9	11.8	72.5	1691
All	5.7	10.1	13.0	71.1	5932

Base: all individuals who were employees when interviewed and who had never been self-employed in the preceding five years

Source: British Social Attitudes Surveys (weighted). Own calculations.

Table 7. What Was the Reason You Did Not Become Self-Employed? (%)

Year	Lack of capital/money	Risk	Economic climate	Other reasons	N
1983	59.3	10.2	2.5	28.0	118
1984	56.0	12.1	0.9	31.0	116
1986	44.7	22.1	0.9	32.3	217
All	51.3	10.6	1.3	31.2	451

Base: employees who reported that they had considered becoming self-employed 'very seriously' or 'quite seriously' in Table 4.

Source: British Social Attitudes Survey Series (weighted). Own calculations.

Table 8. What Help Would Have Been Most Useful to You in Setting-up in Business? (%)

Money/finance	26.3
How to start-up	7.8
Govt regulations	0.8
Tax advice	9.1
Bookkeeping	4.1
Legal advice	1.2
Finding premises	2.5
Finding clients	3.7
Marketing/advertising	1.6
General advice	5.3
Others	5.1
No help desired	32.5
# of observations	243

Base: adults who had become self-employed in the previous four years, were still self-employed and had fewer than six employees.

Source: National Survey of the Self-employed. Own calculations.

Table 9. What Was Your Biggest Concern with Becoming Self-employed? (%)

Where to get finance	20.1
Cashflow	10.8
How to start	4.3
Where to get advice	5.0
Finding premises	5.0
Finding clients	10.1
Competition	3.6
No guaranteed income	14.4
Losing savings	2.9
Understanding tax	14.4
Understanding book-keeping	3.6
Pension	2.9
Employing people	2.2
Effect on family	4.3
Others	8.0
No concerns	3.6
# of observations	139

Base: those 'seriously intending' to become self-employed in the next few months. Source: National

Survey of the Self-employed. Own calculations.



Table 10. Overall Satisfaction with Job: Age 23 in 1981

<u>Per cent answering</u>	<i>Self-employed</i>	<i>Employees</i>	<i>All workers</i>
Very dissatisfied	1.7	2.8	2.8
Dissatisfied	2.9	9.6	9.2
Neither 6.7	8.2	8.1	
Satisfied	42.4	50.2	49.8
Very satisfied	46.2	29.1	30.1
N	519	8657	9176

Base: individuals in employment at the time of interview

Source: National Child Development Study, 1981.

Table 11. Ordered Probit on Overall Satisfaction with Job: Age 23 in 1981

Variable	All		No Inheritance		Inheritance	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Self-employed	0.4235	4.930	0.4911	5.278	-0.0266	0.106
Female	0.1156	3.958	0.1311	4.189	0.0417	0.470
Disabled	-0.1062	0.061	-0.0034	0.019	-0.2521	0.165
Number problems	-0.1442	2.483	-0.1449	2.380	-0.1663	0.795
Married	0.0694	2.580	0.0786	2.711	-0.0074	0.092
Divorced	-0.0468	0.367	-0.0831	0.635	0.6753	0.942
Separated	0.0778	0.906	0.1085	1.178	-0.4742	1.808
Part-time	0.1290	2.095	0.0948	1.445	0.4536	2.382
Union member	-0.0484	1.744	-0.0498	1.681	0.0177	0.204
Ever unemployed	-0.1938	7.076	-0.1777	6.073	-0.2959	3.563
Completed apprenticeship	-0.0236	0.556	-0.0143	0.316	-0.0904	0.673
Experience (months)	0.0008	0.776	0.0008	1.501	-0.0032	1.207
Tenure in current job (mths)	-0.0001	0.016	-0.0001	0.262	-0.0007	0.425
Constant	2.1924	15.007	2.1152	13.541	2.5307	5.281
Threshold (1)	0.7748	28.343	0.7709	26.437	0.8324	9.272
Threshold (2)	1.1207	38.541	1.1160	35.929	1.1971	12.656
Threshold (3)	2.5344	78.574	2.5393	73.538	2.5892	25.303
Log Likelihood	-9536.3		-8323.8		-1184.9	
Restricted Log L.	-9717.9		-8497.0		-1219.9	
Chi Squared (49)	363.27		346.35		70.048	
N	7874		6887		987	

Notes: Ten region dummies, 4 month-of-interview dummies 12 highest qualification dummies and 9 industry dummies are also included.

Source: National Child Development Study, 1981

Table 12. Life-Satisfaction Equation: Age 33 in 1991

	(1)	(2)	(3)	(4)	(5)	(6)
Self-employed	.1101 (2.16)	.1015 (2.00)	.1091 (2.15)	.1114 (2.18)	.1089 (2.19)	.1068 (2.11)
Female	.0861 (2.43)	.1049 (3.05)	.1096 (3.18)	.0971 (2.74)	.0961 (2.71)	.1026 (2.95)
Ever married		1.1187 (25.62)	1.1180 (25.52)	1.1132 (25.26)	1.0989 (24.81)	1.0998 (25.30)
Union member		.0995 (2.74)	.1085 (2.98)	.0911 (2.48)	.0816 (2.20)	.0929 (2.55)
Race dummies	-	-	7	7	7	7
Qualification dummies	-	-	-	11	11	11
Region dummies	-	-	-	-	10	10
Health dummies	-	-	-	-	-	4
Constant	7.3385 (133.12)	6.3630 (94.97)	6.3624 (94.65)	6.3096 (71.87)	6.3943 (56.11)	6.8966 (59.84)
$\bar{R}^2$	.0009	.0739	.0745	.0773	.0790	.1240
F	4.78	168.16	61.85	32.04	22.75	32.40
N	8442	8385	8318	8153	8113	8046

Note: t-statistics in parentheses.

The dependent variable is "satisfaction with the way life has turned out". It is scored from a minimum of zero to a maximum of ten. This is an OLS regression. Means of life satisfaction: self-employed 7.561 and employees 7.464.

Source: National Child Development Study, 1991

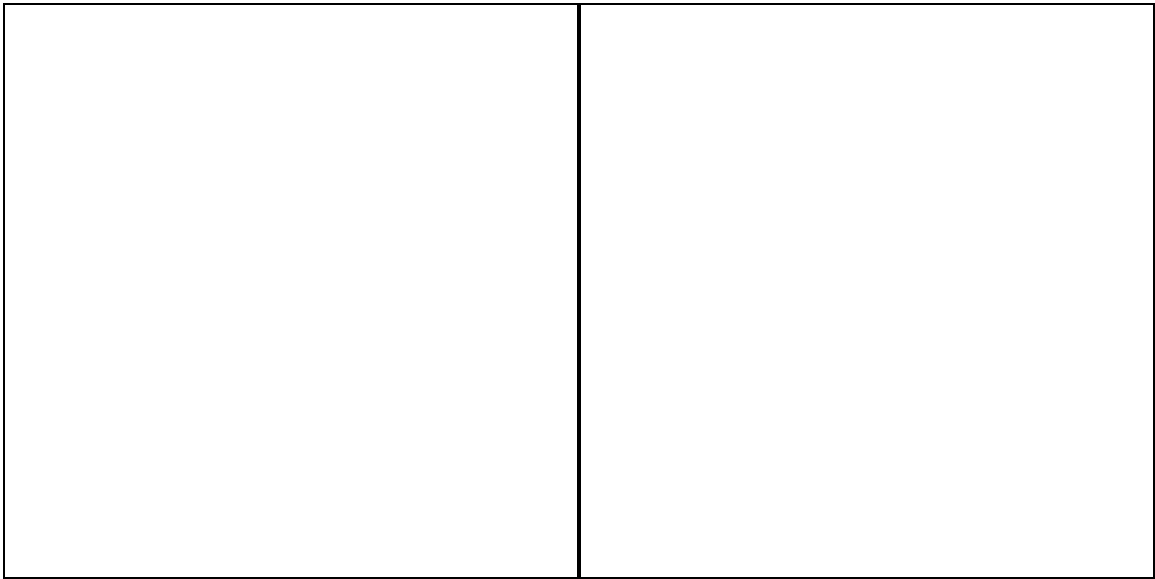
## Appendix A: Proofs

### Proof of Proposition 3

It cannot be the case that  $p(e^*) + i < w$ , because entrepreneurs would leave for the wage-sector, which pays  $w$ . Thus, either marginal entrepreneurial utility,  $p(e^*) + i$ , is equal to  $w$ , or, because people are held back by capital constraints, it exceeds it. As  $p(e)$  is a decreasing function -- it is an array of decreasingly desirable projects -- all other entrepreneurs earn higher profit than the one operating the marginal project. Hence, all but the marginal entrepreneur receives strictly more utility than regular workers, and the marginal entrepreneur gets no less utility than regular workers.

### Proof of Proposition 4

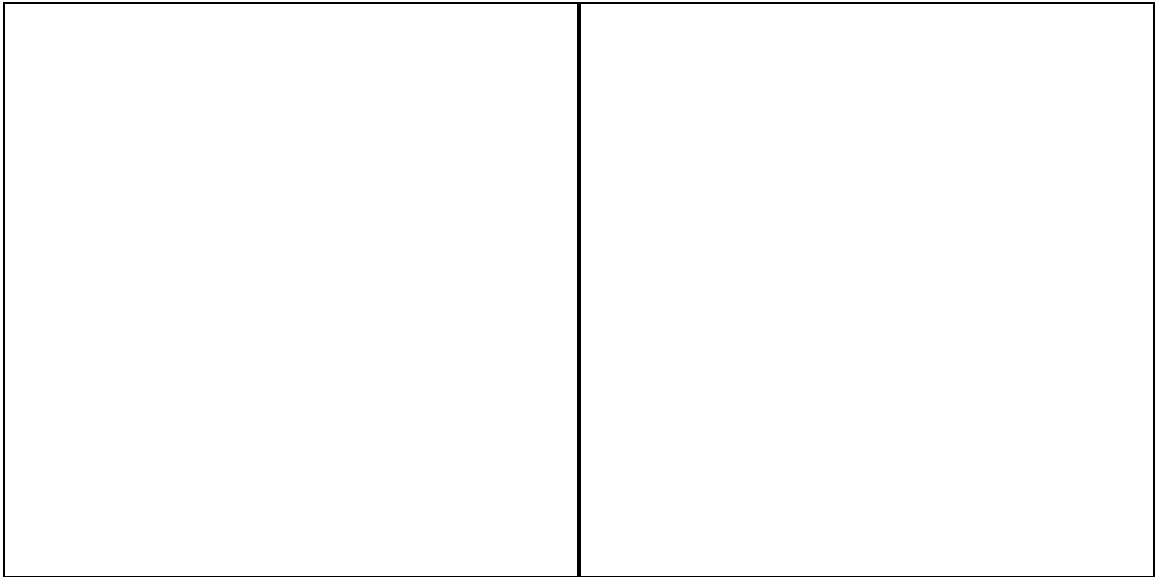
The sum of entrepreneurs' utilities is given by



$$\int_0^{e^*} (\pi(e) + i) de$$

and average entrepreneurial utility by

(5)



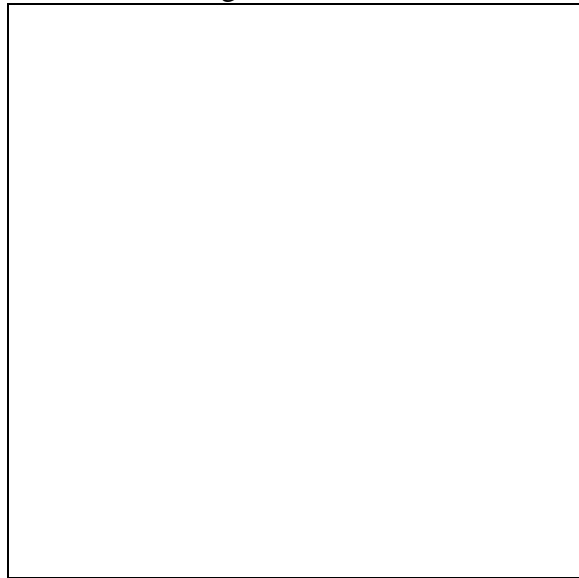
$$\frac{\int_0^{e^*} (\pi(e) + i) de}{\beta Z}$$

(6)

Each worker in the wage sector gets utility equal to the wage  $w$ . There are  $P - \beta Z$  individuals working in that sector. This is because the supply of entrepreneurs is constrained to be the product of  $\beta$  (those with entrepreneurial vision) and  $Z$  (those with capital).

Assuming that the equilibrium is one where there is an aggregate shortage of individuals with capital, free-entry does not eliminate the difference in returns to the marginal entrepreneur between the wage sector and the entrepreneurial sector. Let the average utility gap between the entrepreneurial

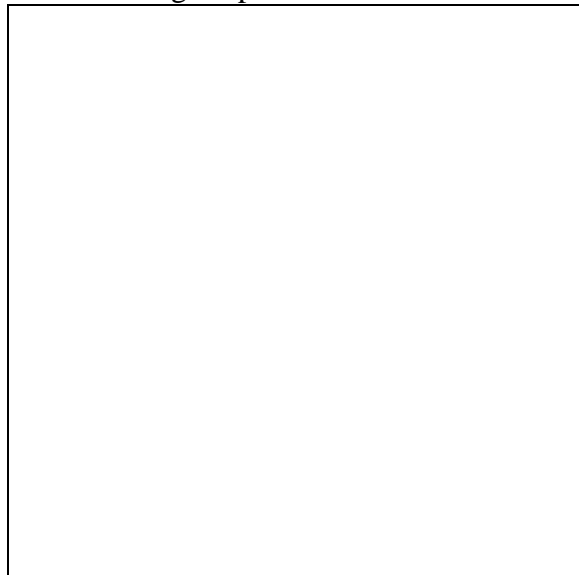
sector and the wage sector be denoted  $v$ . It is given algebraically by



$$v = \frac{\int_0^{\beta Z} [\pi(e) + i] de}{\beta Z} - f'(P - \beta Z)$$

(7)

where the latter term is the marginal product of labor in the wage sector. A rise in  $Z$ , the total number of individuals with sufficient capital to run their own business, increases the numbers setting up enterprises. This drives down the marginal entrepreneurial return and, by inducing workers to leave the wage-sector, raises the marginal product of labor there. Hence the utility difference,  $v$ , changes by:



$$\frac{\check{Z}_V}{\check{Z}_Z} = \frac{1}{Z} [\pi(e^*) + i] - \frac{1}{\beta Z^2} \int_0^{\beta Z} [\pi(e) + i] de + \beta f'(P - \beta Z) \quad (8)$$

The third of these three terms is unambiguously negative, by the concavity of the production function, so to establish the Proposition it is sufficient to show that the first two terms sum to a negative number. Informally this can be seen from the fact that the sum of these two terms equals one over  $Z$  multiplied by the difference between the marginal entrepreneur's return and the average entrepreneur's return. A more formal proof can be produced by applying the First Mean Value Theorem.

## Appendix B: Further Data Sources

### 1. British Social Attitudes Survey Series, 1983-1989

This series of surveys, core-funded by the Sainsbury Family Trusts, was designed to chart movements in a wide range of social attitudes in Britain. The data derive from annual cross-sectional surveys from a representative sample of adults aged 18 or over living in private households in Great Britain whose addresses were on the electoral register. The first three surveys involved around 1800 adults; the numbers were increased to 3000 in 1986. The sampling in each year involved a stratified multi-stage design with four separate stages of selection. For further details of the survey designs, non-responses etc. see British Social Attitudes, 1983, 1984, 1985, 1986, 1987, 1989, 1990 edited by R. Jowell, S. Witherspoon and L. Brook, SCPR, Gower Press.

### 2. National Survey of the Self-Employed, 1987

In February and March 1987 the British Department of Employment commissioned a nationally representative sample of 12,000 British adults. Interviews were then conducted with three sub-groups drawn from this initial sample: past, present and future self-employed. In this paper we focus on the latter two groups. They were selected according to the following criteria.

- 1) Current self-employed - adults who had become self-employed in the previous four years, 1983-1987, were still self-employed and had fewer than six employees (243 interviews).
- 2) Potential self-employed - adults who said they were 'seriously intending' to take up self-employment in the next 12 months (139 interviews).

### 3. The International Social Survey Programme, 1989 and 1991.

The International Social Survey Programme (ISSP) is a voluntary grouping of study teams (11 in 1989 and 13 in 1991) each of which undertakes to run a short, annual self-completion survey containing the same set of questions in each country. The surveys are probability-based national samples of adults. The topics change from year to year, with a view to replication every five years or so. Surveys are currently available for the years 1985-1991.

### 4. The General Social Surveys 1972-1990.

The General Social Surveys (GSS) have been conducted by the National Opinion Research Center at the University of Chicago for the years 1972-1990. There were no surveys in 1979 and 1981. Each survey is an independently drawn sample of English-speaking persons 18 years of age or over, living in non-institutional arrangements within the United States.



Appendix C: Variable Definitions in the National Child Development Study (NCDS)

<i>Variable Definitions</i>	<i>Year of NCDS</i>	<i>Description</i>	<i>Mean</i>
<u>1. Independent variables</u>			
a) NCDS4			
Inheritance/gift	4	the value of any inheritance or gift received above a threshold value (£)	378.21
Unforthcoming score	1T	unforthcoming score in psychological test: 0 = forthcoming	1.6588
Hostility score	1T	hostility-to-children score in psychological test : 0 = not hostile	0.6658
Acceptance anxiety score	1T	anxiety-for-acceptance-by-children score in psychological test: 0 = not anxious	.2994
Father manager (< 25)	2P	(1,0) dummy if father was a manager in central, local government, industry or commerce in an establishment employing < 25 people	.1209
Father: own account worker	2P	(1,0) dummy if father worked "on his own account"	.0341
Father: farmer employer	2P	(1,0) dummy if father was a farmer and employer	.0108
Father: farmer own account	2P	(1,0) dummy if father was a farmer on his own account	.0098
Father: agricultural worker	2P	(1,0) dummy if father was an agricultural worker	.0131
County unemployment rate	4	the county unemployment rate in natural logarithms	2.4032
Female	4	(1,0) dummy if female	.4425
Apprenticeship	4	(1,0) dummy if the respondent had ever taken an apprenticeship	.1784
b) NCDS5			
			Mean
Inheritance/gift	5	the value of inheritance or gift received (£)	1563.0
Unforthcoming score	1T	unforthcoming score: 0 = forthcoming	1.6839
Hostility score	1T	hostility-to-children score: 0 = not hostile	0.6715
Acceptance anxiety score	1T	anxiety-for-acceptance-by-children score: 0 = not anxious	0.3403
Father manager (< 25)	2P	(1,0) dummy if father was a manager in central, local government, industry or commerce in an establishment employing < 25 people	.0925
Father: own account worker	2P	(1,0) dummy if father worked on his own account	.0266
Father: farmer employer	2P	(1,0) dummy if father farmer - employer	.0102
Father: farmer own account	2P	(1,0) dummy if father farmer - own account	.0085
Father: agricultural worker	2P	(1,0) dummy if father agricultural worker	.0117

Father: social class missing	2P	(1,0) dummy if father's social class missing	.1650
Regional unemployment rate	5	the region's unemployment rate in natural logarithms	2.0750
Female	5	(1,0) dummy if female	.4341

<i>Variable Definitions</i>	<i>Year of NCDS</i>	<i>Description</i>	<i>Mean</i>
<u>2. Dependent variables</u>			
a) NCDS4 Self-employed	4	(1,0) dummy if the individual was self-employed in their main occupation in 1991.	0.0566
b) NCDS5 Self-employed	4	(1,0) dummy if the individual was self-employed in their main occupation in 1991.	0.1424

Notes All individuals were born in 1958. The numbers NCDS 1-5 denote the five sweeps of the survey undertaken since the initial birth study (the Perinatal Mortality Survey), when the respondents were ages 7, 11, 16, 23, and 33. The most recent sweep was in 1991. The following letters indicate who completed the interview forms: P= parental response; T= teacher response.

## Appendix D

Table A 1. Happiness Data from the International Social Surveys, 1991

### Question

"If you were to consider your life in general these days, how happy or unhappy would you say you are on the whole?"

### Responses

	Employees	Self-employed
Not at all happy	1.50	1.48
Not very happy	8.69	8.06
Fairly happy	63.50	61.52
Very happy	26.32	28.94
N	4548	881

### Ordered Probit Equation for Happiness: ISSP

	Coefficient	Standard Error
Self-employed	.1042	.0446
Northern Ireland dummy	.2487	.0784
USA dummy	.1723	.0651
Italy dummy	-.6829	.0721
Eire dummy	.2959	.0739
Israel dummy	-.5237	.0716
Norway dummy	-.3220	.0653
West Germany dummy	-.2396	.0664
New Zealand dummy	-.1154	.0696
Male	-.1360	.0330
Age 25-34 years	-.1777	.0573
Age 35-44 years	-.3256	.0608
Age 45-54 years	-.3242	.0651
Age 55-64 years	-.4438	.0749
Age 65-74 years	.1414	.1467
Age >=75 years	-.0089	.4228
Widowed	-.5575	.0992
Divorced/separated	-.5714	.0645
Never married	-.3964	.0456
Threshold 1	-2.9145	.0891
Threshold 2	-1.9584	.0790
Threshold 3	.0723	.0748

Log Likelihood	-4665.5664
N	5387
chi <sup>2</sup> (19)	517.32
Pseudo R <sup>2</sup>	0.0525

Excluded categories: Great Britain, <25 years, married  
Because of missing values, N is slightly smaller than the sum of 4548 and 881.

Table A 2. Happiness Data from the US General Social Surveys, 1972-1990

Question

"Taken all together, how would you say things are these days - would you say that you are very happy, pretty happy, or not too happy?"

Responses

	Employees	Self-employed
Not too happy	10.64	8.77
Pretty happy	57.85	53.50
Very happy	31.52	37.72
N	13238	1983

Ordered Probit Equation for Happiness: GSS

	Coefficient	Standard Error
Self-employed	.0729	.0285
Male	-.1230	.0194
Age	-.0216	.0046
Age squared	.0002	.0000
Married	.3669	.0279
Widowed	-.2843	.0570
Divorced	-.1444	.0385
Separated	-.2203	.0561
Ever unemployed last 5 yrs	-.1900	.0312
Black	-.3253	.0293
Other non-white	-.0067	.0677
Years of schooling	.0282	.0033
Threshold 1	-1.0829	.1108
Threshold 2	.7158	.1107
Log Likelihood	-13749.05	
N	15221	
chi <sup>2</sup> (36)	1034.08	
Pseudo R <sup>2</sup>	.0369	

Notes: Equation also includes 8 region dummies and sixteen year dummies. Excluded categories are single and white.

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