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# What Makes an Entrepreneur?

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This article uses various micro data sets to study entrepreneurship. Consistent with the existence of capital constraints on potential entrepreneurs, the estimates imply that the probability of self-employment depends positively upon whether the individual ever received an inheritance or gift. When directly questioned in interview surveys, potential entrepreneurs say that raising capital is their principal problem. Consistent with our theoretical model's predictions, the self-employed report higher levels of job and life satisfaction than employees. Childhood psychological test scores, however, are not strongly correlated with later self-employment.

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

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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)

## I. Introduction

Most Western governments provide encouragement and tax breaks to those who run small businesses. This appears to be because politicians believe, for reasons not always clearly articulated, 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. For example, the International Social Survey Programme of 1989 asked random samples of individuals from 11 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 1,453 asked), 48% of Britons (out of 1,297), and 49% of Germans (out of 1,575). 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 their own business? In this article, we explore 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. Microeconometric 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).[1] This article follows in the general spirit of

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[1] OECD (1986) and Blau (1987) are aggregate time-series studies. Theoretical analysis relevant to this article's results includes Rosen (1983), Shorrocks (1988),

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 U.S. 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 1966–81 and the Current Population Surveys for 1968–87. 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 forgo 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 article provides, in Section IV, a new test of the finance-constraint hypothesis. The test uses data on inheritances and gifts. Studying the behavior of those who receive money is presumably as close as the economist can get to the idealized laboratory experiment in which some subjects are issued 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 receipt of an inheritance is not an entirely random event, so this study does not provide a perfect test. Individuals who receive them may come from backgrounds that make those people, for some unmeasured reasons, prone to self-employment. Moreover, those who receive inheritances within families may be those who are—again for unmeasured reasons—better suited to self-employment. It is not possible, without a true experiment, to assuage all such concerns. However, the article presents various complementary forms of evidence for its claims. One draws upon questionnaires. Although simple, this is of a kind apparently not

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Casson (1990), and Holmes and Schmitz (1990). New empirical papers include Reid and Jacobsen (1988), De Witt and Van Winden (1990), Lentz and Laband (1990), Meyer (1990), Reid (1990), Holmes and Schmitz (1991), and Blanchflower and Meyer (1994). Work by Black, de Meza, and Jeffreys (1996) finds, consistent with the general tenor of the approach taken here, that house asset values play an important role in shaping the supply of entrepreneurs.

reported before in the literature. Data from interviews with random samples of individuals demonstrate that, when asked, 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 V describes 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 article 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 disappointing. Individuals' psychology—at least using the data available here—does not seem to 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 VI, we suggest and implement an econometric test of this hypothesis, using data of a kind more commonly studied by psychologists.

## II. 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. This might be thought to be because the expected returns from new ideas and openings are inherently impossible to quantify. 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 businessperson 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 re-

sponse 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 suboptimality 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 Khilstrom and Laffont (1979), Kanbur (1982), 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 Knight (1921), Schumpeter (1939), 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.

Our model draws upon the older, but recently neglected, current of thought. It builds upon eight assumptions. Assume that proportion $\beta$ of the population has entrepreneurial vision. This group of individuals can see business opportunities where proportion $1 - \beta$ see none. There is, in this economy, an array of potential entrepreneurial projects that have not yet been developed, each of which requires a different amount of capital, $k$. Each project needs one entrepreneur's labor. The profit from project $k$—indexing in this way for simplicity—is $\pi(k)$. This function describes the return from the different entrepreneurial ventures in the economy. It is assumed to be strictly increasing, because any high-profit projects that required little capital have already been undertaken. There is a distribution of capital endowments across the population. Denote it $f(k)$, where $k$ lies between zero and one. The latter normalizes the richest person's capital assets at unity.

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 opportuni-

ties 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.[2] Denote utility by $u$. Individuals receive utility $u = \pi + i$ in self-employment, and $u = w$ in conventional employment, where $w$ is defined as the wage paid for nonentrepreneurial work, and $i$ is the nonpecuniary utility from being independent and one's own boss. Assume that anyone can find work at wage $w$ in the nonentrepreneurial 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, $N$, in the sector. Population is normalized at unity. In equilibrium, 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 has been 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,

$$w = \pi(k^*) + i, \tag{1}$$

wage = profit from self-employment

+ nonpecuniary utility from independence,

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

$$E = \beta \int_{k^*}^{1} f(k)\,dk + \beta z \int_{0}^{k^*} f(k)\,dk \tag{2}$$

$$= 1 - N. \tag{3}$$

This is also, by the choice of units, the probability of self-employment for one individual. From equation (2), the total number of entrepreneurs in the economy is equal to the probability of "vision" multiplied by the number of people with a greater capital endowment than $k^*$ (that needed

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[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 article requires only that $z$ be less than unity.

for the marginal project) plus the probability of vision multiplied by the probability of successfully getting an unsecured business loan multiplied by the number of individuals who are inherently short of capital.

Equilibrium in this economy can take two different forms. One is described by the simultaneous solution of equations (1)–(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 β-individuals with capital, those people earn a rent, so that

$$\pi(k^*) + i > w. \tag{4}$$

This distortion might be viewed as a result of the asymmetric information—about whether a project is good—between bankers and those individuals in the population who were born with entrepreneurial vision.

A number of results follow.

PROPOSITION 1.   When the market for entrepreneurs clears ($\pi(k^*)$ $+ i = w$), the following raise the equilibrium number of entrepreneurs and the economy's wage rate: (i) an increase in β, 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 ($\pi(k^*) + i > w$), the following raise the equilibrium number of entrepreneurs and the economy's wage rate: (i) an increase in β, 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.

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.

For proofs, see appendix A.

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, because they do not have a large enough capital endowment, $k$, or 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.[3] 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. 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.

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 than entrepreneurs. The second is that individuals who run their own enterprises have higher utility than those who are employees in the wage sector. Sections III and IV 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 V implements a test using reported satisfaction levels as proxy utility data.

### III. Data and Methods

Whether or not individual $j$ is self-employed depends on a joint probability captured by the constituent parts of equation (2):

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, we estimate 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, 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

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[3] It is assumed that the existence of any specialist venture-capital companies is not sufficient to remove the distortion created by asymmetric information.

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 lasting 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 article—partly because of the nature of the data—adopts the second approach. Recent work by Holtz-Eakin, Joulfaian, and Rosen (1994*a,* 1994*b*), which follows an early version of this article, takes route i and shows that inheritances both raise entry and slow exit. Recent cross-sectional Swedish evidence on ii is contained in Lindh and Ohlsson (1996).

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 March 3 and 9, 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. Details of the survey design are summarized in Elias and Blanchflower (1989).

We make use of information about employment status that was collected in the interviews of 1981 (NCDS4) and 1991 (NCDS5). These have the useful feature that they provide 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 people were self-employed, while 8,657 worked as employees. Hence, approximately one in 18 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, 1,279 were self-employed, while a further 7,703 were employees. Thus, 10 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 (*Employment Gazette,* vol. 93, no. 1 [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. We study 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 (though not in 1991) whether 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, we also use 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?" (NCDS4, question 9; NCDS5, question E11). This question was asked in both sweeps of the National Child Development Study. In 1981, 1,060 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. Of these monies, 6.4% were received before 1975, 25.7% between 1975 and 1978, and the rest received between 1979 and 1981. In the 1991 data, 2,927 working individuals said they or their spouses had received a gift or inheritance of £500 or more. Eighty percent 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 to 1991. Among those who received a sum, the mean size of payment received by workers was £3,617 in 1981 (with a standard deviation of £8,421) and £5,655 in 1991 (with a standard deviation of £18,700). 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

**Table 1**
**Size of Inheritances/Gifts**

| Size of Inheritance/Gift | % of Employed | % of Self-Employed | % of Each Category Self-Employed | N |
|---|---|---|---|---|
| A. NCDS4, individuals aged 23 years: | | | | |
| £0 | 88.7 | 83.8 | 5.3 | 8,089 |
| £500–£999 | 3.5 | 2.7 | 4.4 | 319 |
| £1,000–£1,999 | 3.9 | 4.5 | 6.4 | 361 |
| £2,000–£4,999 | 2.3 | 3.3 | 7.8 | 219 |
| £5,000–£9,999 | .8 | 2.9 | 18.1 | 83 |
| £10,000–£19,999 | .5 | 1.8 | 18.4 | 49 |
| £20,000 and over | .3 | 1.0 | 16.1 | 29 |
| B. NCDS5, individuals aged 33 years: | | | | |
| £0 | 72.6 | 71.0 | 14.0 | 8,159 |
| >£0–£499 | 5.7 | 4.3 | 11.1 | 578 |
| £500–£999 | 5.9 | 4.8 | 11.9 | 600 |
| £1,000–£1,999 | 5.2 | 4.5 | 12.5 | 527 |
| £2,000–£4,999 | 4.9 | 6.2 | 17.3 | 530 |
| £5,000–£9,999 | 2.8 | 3.1 | 15.7 | 306 |
| £10,000–£19,999 | 1.6 | 2.8 | 22.4 | 203 |
| £20,000–£49,999 | 1.0 | 2.3 | 27.5 | 138 |
| £50,000 and over | .4 | 1.0 | 33.3 | 45 |

NOTE.—All values here are in constant 1981 pounds.

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 in table 1 from both NCDS4 and NCDS5. These raw data reveal a strong 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.

## IV. Self-Employment Probits Using NCDS Data

Tables 2 and 3 estimate self-employment probit equations using NCDS4, that is, the data when the respondents were 23 years old. The independent variables include standard personal characteristics, regional variables, information on the father's occupation when the respondent was 14 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 predetermined variables. The variables for father's occupation are more detailed than is common in microeconomic data sets. Usefully, they make it possible to control for whether the individual's father was a farmer or self-employed. The full definition of "own account" is not given in the codebooks but appears to be an old-

**Table 2**
**Probit Equations for Self-Employment at Age 23 in 1981**

| | (1) | (2) | (3) | Nonlinear Two-Stage Least Squares (4) |
|---|---|---|---|---|
| Inheritance/gift | .00002 | .00016 | . . . | . . . |
| | (.00001) | (.00004) | | |
| Inheritance/gift squared $*10^6$ | . . . | −.0041 | . . . | . . . |
| | | (.0019) | | |
| Log of inheritance/gift* | . . . | . . . | .0406 | .1994 |
| | | | (.0120) | (.0672) |
| Unforthcoming score | −.0491 | −.0487 | −.0475 | −.0380 |
| | (.0266) | (.0266) | (.0266) | (.0330) |
| Hostility score | .0563 | .0556 | .0557 | .0599 |
| | (.0352) | (.0353) | (.0353) | (.0375) |
| Acceptance anxiety score | −.0659 | −.0663 | −.0676 | −.0801 |
| | (.0742) | (.0744) | (.0740) | (.0771) |
| Apprenticeship | .4895 | .4997 | .4913 | .5725 |
| | (.1245) | (.1249) | (.1247) | (.1434) |
| Father: manager employing <25 | .6077 | .5693 | .5725 | .3857 |
| | (.1470) | (.1480) | (.1477) | (.1785) |
| Father: own account worker | .7227 | .7053 | .7100 | .6948 |
| | (.2366) | (.2370) | (.2369) | (.2328) |
| Father: farmer employer | 2.0003 | 1.9520 | 1.9823 | 1.9098 |
| | (.2800) | (.2813) | (.2785) | (.2093) |
| Father: farmer own account | 2.3013 | 2.3046 | 2.2878 | 2.5238 |
| | (.2833) | (.2838) | (.2845) | (.3103) |
| Father: agricultural worker | .5743 | .6085 | .6078 | .9587 |
| | (.4051) | (.4052) | (.4051) | (.3103) |
| Female | −1.0413 | −1.0607 | −1.0580 | −1.2976 |
| | (.1359) | (.1367) | (.1363) | (.2668) |
| Log county unemployment rate | −.9408 | −.9063 | −.9293 | −.8689 |
| | (.1924) | (.1928) | (.1923) | (.2330) |
| Constant | −.5540 | −.6725 | −.4438 | −.3522 |
| | (.4571) | (.4589) | (.469) | (.5347) |
| Log likelihood | −1,368.03 | −1,359.83 | −1,364.25 | . . . |
| $\chi^2$ | 238.22 | 254.62 | 245.78 | . . . |
| Pseudo $R^2$ | .0801 | .0856 | .0826 | . . . |
| Restricted log likelihood | . . . | . . . | . . . | −347.98 |
| N | 6,885 | 6,885 | 6,885 | 6,885 |

SOURCE.—National Child Development Study, 1981.
NOTE.—Standard errors are in parentheses. The variables for unforthcoming, hostility, and acceptance anxiety are from psychological assessments made during childhood. "Own account" means a form of self-employment. Columns 1, 2, and 3 have no instrumenting. Column 4 instruments the inheritance variable with variables for mother dead, father dead, both parents dead, county unemployment rate, gender, and five dummies for father's social and occupational class.
* Zero inheritances were set to .01 before taking natural logarithms.

fashioned term for being self-employed without employees. By contrast, a "farmer employer" has employees. 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 article, it is worth noting the negative effects of the local unemployment rate and the female dummy (replicating findings on a

**Table 3**
**Self-Employment Probit Equations Controlling for the Nature of Firm and Inheritance: Age 23 in 1981**

| | Not Family Firm (1) | Inheritance/Gift before 1978 (2) | Inheritance/Gift ≥3 Years Prior Self-Employment (3) |
|---|---|---|---|
| Log of inheritance/gift* | .0359 | .0655 | .0707 |
| | (.0140) | (.0176) | (.0272) |
| Unforthcoming score | −.0423 | −.0525 | −.0646 |
| | (.0298) | (.0279) | (.0291) |
| Hostility score | .0817 | .0746 | .0787 |
| | (.0369) | (.0358) | (.0365) |
| Acceptance anxiety score | −.0489 | −.1096 | −.1074 |
| | (.0809) | (.0806) | (.0816) |
| Apprenticeship | .5226 | .4323 | −1.1039 |
| | (.1400) | (.1321) | (.2095) |
| Father: manager employing <25 | .2876 | .5997 | .6238 |
| | (.1763) | (.1562) | (.1606) |
| Father: own account worker | .5472 | .6605 | .6887 |
| | (.2720) | (.2544) | (.2607) |
| Father: farmer employer | .7627 | 1.9209 | 1.9300 |
| | (.4790) | (.3089) | (.3188) |
| Father: farmer own account | .6185 | 2.3288 | 2.5002 |
| | (.6066) | (.2994) | (.3040) |
| Father: agriculture worker | .5840 | .6559 | .6872 |
| | (.4345) | (.4066) | (.4075) |
| Female | −.9830 | −1.0808 | −1.0688 |
| | (.1547) | (.1439) | (.1484) |
| Log county unemployment rate | −1.0809 | −1.1061 | −1.1039 |
| | (.2172) | (.2042) | (.2095) |
| Constant | −.3204 | .1170 | .1154 |
| | (.5126) | (.4865) | (.5061) |
| Log likelihood | −1,127.84 | −1,230.37 | −1,175.35 |
| $\chi^2$ | 127.88 | 228.06 | 223.49 |
| Pseudo $R^2$ | .0537 | .0848 | .0868 |
| N | 6,786 | 6,321 | 6,165 |

SOURCE.—National Child Development Study, 1981.
NOTE.—Standard errors are in parentheses. These equations are not instrumented. Column 1 is for the subsample of self-employed people 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 3 years before the person entered self-employment.
* Zero inheritances were set to .1 before taking natural logarithms.

different UK data set in Blanchflower and Oswald [1990*a*]), 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 2 reveals that, in the simplest linear specification, the inheritance/gift variable enters positively with a coefficient that is positive and statistically significant at the 5% level. Column 2 tests for a quadratic form. Both the level and the square are significant at better than the 5% level. Further evidence for a nonlinearity emerges from column 3 of table 2, which switches to the logarithm of inheritance/gift (assigning 0.01 to those values of zero). The coefficient enters with a coefficient of 0.04 with a standard error of 0.01. For simplicity, this article continues to use a log structure in table 3.

Table 3 probes the nature of the correlation between self-employment and receipt of an inheritance or gift. First, in column 1 of table 3 the sample is restricted to those who are not self-employed in family firms (using answers to the question "Are you self-employed in a firm belonging to your family?"). The gift/inheritance variable remains strongly significant. The column 1 estimation is an attempt to demonstrate that table 2's inheritance/ gift effect is not merely proxying for the fact that children inherit family firms. It is possible, as a referee has pointed out, that some people who inherited businesses from their parents may not refer to them as family firms, but the variable is the best available in this data set. Second, because children who are about to go into business may approach their own families for loans, it is possible that the results in columns 1–3 of table 2 might be contaminated by simultaneity bias. Although the need to use family money in this way could itself be construed as an illustration of capital constraints, two procedures were followed in an attempt to allow for the possible endogeneity of the inheritance/gift variable.

Column 4 of table 2 reports estimates using nonlinear two-stage least squares. Here a good instrument is required, and the data set seems to contain one. The variable for inheritances or gifts is assumed to be a function of whether one or both of the individual's parents had died (research on the determinants of inheritance is sparse but includes Cox [1987] and Wilhelm [1991]). This ought to be an effective way to instrument, because the death of a father or mother should have no effect on the self-employment decision per se but should, and does, enter significantly into an equation for inheritances or gifts (examples of such equations are given in app. A). Approximately 14% of the sample had lost at least one parent in 1981. The exact figures are in table A.

To exploit a form of lag as an alternative to instrumenting, columns 2

**Table A**

|  | Mother Alive | Mother Dead |
|---|---|---|
| Father alive | 10,797 | 426 |
| Father dead | 1,135 | 94 |

and 3 of table 3 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 predetermined inheritance/gift variable. The coefficient in each case is approximately 0.07 with a standard error of less than 0.03, so this method seems to confirm the role of inheritances/gifts in entrepreneurship equations and to suggest that the evidence for effects from capital is not created by simultaneity bias. A 3-year preinheritance 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 different sets of results—uninstrumented, instrumented, and lagged—all find statistically significant inheritance effects and are thus consistent with the existence of capital constraints. The size of the inheritance/gift effects is large. From the probit equations it is possible to calculate that 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 (the instrumental variable [IV] estimates are even greater, and perhaps implausibly large). For example, a male in the southeast of England, with an apprenticeship and whose father was a manager in a workplace with under 25 employees, had a probability of 0.16 of being self-employed without an inheritance and/or gift. This probability was 0.37 if he had received an inheritance of £5,000. In the case of females, the probabilities were 0.07 and 0.21, respectively. This seems a big effect even when contrasted with the Evans-Jovanovic estimate that removing all liquidity constraints would increase the flow of entrepreneurs from 3.8% to 5.1% (Evans and Jovanovic 1989, p. 824). The likely explanation—apart from possible U.S. 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 age 23 is too young to study self-employed people. Hence, table 4 re-does the analysis for the 1991 sweep of the panel, that is, when these individuals were age 33. Table 4 provides a probit equation for self-employment at that date. It is designed to be close in specification to the earlier tables and 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 33 years of age. As in tables 2 and 3, the dependent variable is set to one 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 much higher (the mean level of inheritance received was £4,692 for the employed and £11,148 for the self-employed).

**Table 4**
**Probit Equations for Self-Employment at Age 33 in 1991**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Inheritance/gift$*10^2$ | .00085 | .0012 | .00058 | .00072 | .00073 | .00098 | .00068 | .00071 | .00051 | .00060 |
| | (4.88) | (4.65) | (3.17) | (2.42) | (4.29) | (3.74) | (3.97) | (4.15) | (2.79) | (3.18) |
| Inheritance/gift squared$*10^8$ | ... | −.0017 | ... | −.00061 | ... | −.00118 | ... | ... | ... | ... |
| | | (1.98) | | (.63) | | (1.32) | | | | |
| Self-employed in 1981 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1.4757 |
| | | | | | | | | | | (19.91) |
| Unforthcoming score | ... | ... | ... | ... | ... | ... | ... | ... | −.0110 | ... |
| | | | | | | | | | (1.33) | |
| Hostility score | ... | ... | ... | ... | ... | ... | ... | ... | .0146 | ... |
| | | | | | | | | | (1.17) | |
| Acceptance anxiety score | ... | ... | ... | ... | ... | ... | ... | ... | −.0064 | ... |
| | | | | | | | | | (2.25) | |
| Father: manager employing <25 | ... | ... | .2784 | .2798 | .2800 | .2826 | .2681 | .2628 | .2808 | .2320 |
| | | | (2.72) | (2.73) | (2.73) | (2.76) | (2.60) | (2.56) | (2.61) | (1.81) |
| Father: own account worker | ... | ... | .4372 | .4389 | .4395 | .4425 | .4281 | .4329 | .4387 | .4432 |
| | | | (3.44) | (3.46) | (3.46) | (3.48) | (3.35) | (3.40) | (3.29) | (2.82) |
| Father: farmer employer | ... | ... | .8389 | .8360 | .8338 | .8294 | .8668 | .8444 | .9257 | .6958 |
| | | | (5.12) | (5.10) | (5.09) | (5.06) | (5.23) | (5.13) | (5.44) | (3.18) |
| Father: farmer own account | ... | ... | .6887 | .6910 | .6926 | .6964 | .7050 | .7018 | .7547 | .5623 |
| | | | (3.79) | (3.80) | (3.80) | (3.82) | (3.81) | (3.84) | (3.97) | (2.45) |
| Father: agricultural worker | ... | ... | .1975 | .2015 | .2031 | .2098 | .2460 | .1891 | .2938 | −.0526 |
| | | | (1.15) | (1.17) | (1.18) | (1.21) | (1.41) | (1.09) | (1.64) | (.22) |
| Father: class missing NCDS2 | ... | ... | ... | ... | .1024 | .1060 | .1051 | .0980 | .0814 | .0515 |
| | | | | | (1.05) | (1.08) | (1.07) | (1.00) | (.77) | (.41) |
| Female | −.3596 | −.3596 | −.3412 | −.3412 | −.3584 | −.3584 | −.3576 | −.3579 | −.3611 | −.2941 |
| | (10.30) | (10.29) | (8.87) | (8.87) | (10.19) | (10.19) | (10.08) | (10.13) | (9.47) | (6.42) |
| Log regional unemployment rate | ... | ... | ... | ... | ... | ... | ... | −.4611 | ... | ... |
| | | | | | | | | (3.78) | | |
| Regional dummies | ... | ... | ... | ... | ... | ... | 10 | ... | 10 | 10 |
| Parental social class dummies | ... | ... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 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) | (.98) | (6.32) | (7.14) |
| Log likelihood | −3,511.82 | −3,510.36 | −2,900.20 | −2,900.02 | −3,468.41 | −3,467.71 | −3,419.20 | −3,440.30 | −3,030.03 | −2,162.18 |
| $\chi^2$ | 137.61 | 140.51 | 187.40 | 187.76 | 223.82 | 225.21 | 279.66 | 237.46 | 259.74 | 649.36 |
| $N$ | 8,757 | 8,757 | 7,322 | 7,322 | 8,755 | 8,755 | 8,710 | 8,710 | 7,760 | 5,998 |

Column 1 of table 4 is a probit equation that includes only the amount of inheritance/gift in constant 1981 pounds. The level of inheritance/gift enters with a coefficient of $0.85*10^{-5}$ 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 only marginal evidence that the relationship is a quadratic. A log specification also worked reasonably well (not reported). The inheritance effect is robust to the inclusion of parental class variables in column 3. These variables work very similarly to those in tables 2 and 3 above. The squared inheritance term is insignificant when parental social class—proxied by 12 dummies for father's occupation—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 exact measures of father's occupation are listed in the regression in appendix E.

The inheritance variable is robust to the inclusion of regional dummies (col. 7), or the regional unemployment rate (col. 8), which once again enters negatively. Column 9 of table 4 includes the three personality scores provided by the schoolteacher 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. This article does not re-do table 3 for the later sample of 33-year-olds. One reason is that NCDS5 does not record information on family firms.

As usual with econometric analysis, we cannot 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.

At a referee's suggestion, some final checks were performed. First, table 2's regressions were re-done using only the subsample of individuals who did not receive a gift or inheritance, but including dummy variables for whether one or both parents of the individual had died. This tests whether parents' death might directly cause independence or an entrepreneurinal

**Table 5**
**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 | 1,470 |
| 1987 | 4.9  | 9.7  | 14.0 | 71.4 | 1,273 |
| 1989 | 5.9  | 9.9  | 11.8 | 72.5 | 1,691 |
| All  | 5.7  | 10.1 | 13.0 | 71.1 | 5,932 |

SOURCE.—British Social Attitudes Surveys (weighted). Own calculations.
NOTE.—Base: all individuals who were employees when interviewed and who had never been self-employed in the preceding 5 years.

spirit. However, reassuringly for this article, the parental-death dummy variables were grossly insignificant. Second, for a subsample of individuals who had had no inheritance or gift prior to 1981, a probit equation was estimated to see if those who had a gift/inheritance between 1981 and 1991 were more likely to have have been self-employed in 1981. This tests the idea that any crucial omitted variables—linking self-employment and inheritances through other, possibly unknown, mechanisms—would probably begin to have an effect before the gift/inheritance was received. Supportively for our conclusions, however, the variable for being self-employed in 1981 entered with a $t$-statistic of only 0.1. These two checks seem to be consistent with our favored approach.

## V. Interview Evidence on Capital Constraints

New survey findings are consistent with the idea that both current and potential self-employed business owners feel constrained by limited capital. Our aim in this section is to provide evidence more direct than, and complementary to, that 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 5,947 randomly chosen employees who had not been self-employed in the previous 5 years (97.1% of all employees) the question, "How seriously have you considered being self-employed?" The answers are given in table 5. On average, 16.8% had considered running their own business either "very seriously" or "quite seriously." In 1983, 1984, and 1986 a subsample 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

**Table 6**
**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 | .9 | 31.0 | 116 |
| 1986 | 44.7 | 22.1 | .9 | 32.3 | 217 |
| All | 51.3 | 10.6 | 1.3 | 31.2 | 451 |

SOURCE.—British Social Attitudes Survey Series (weighted). Own calculations.
NOTE.—Base: employees who reported that they had considered becoming self-employed "very seriously" or "quite seriously" in table 4.

in their own words, are reported in table 6. 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 who were in this special category,[4] 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 7 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 recorded item (mentioned by a quarter of respondents), 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 20 possible answers from which they had to select one. The main responses are reported in table 8 and show that the single most common answer was that individuals were worried about how to raise the necessary finance (mentioned by a fifth of respondents).

[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.

Table 7
**What Help Would Have Been
Most Useful to You in
Setting-Up in Business? (%)**

| | |
|---|---|
| Money/finance | 26.3 |
| How to start up | 7.8 |
| Government regulations | .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 |
| No. of observations | 243 |

Source.—1987 National Survey of the Self-Employed. Own calculations.
Note.—Base: adults who had become self-employed in the previous 4 years, were still self-employed and had fewer than six employees.

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 infor-

Table 8
**What Was Your Biggest Concern
with Becoming Self-Employed? (%)**

| | |
|---|---|
| Where to get finance | 20.1 |
| Cash flow | 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 bookkeeping | 3.6 |
| Pension | 2.9 |
| Employing people | 2.2 |
| Effect on family | 4.3 |
| Others | 8.0 |
| No concerns | 3.6 |
| No. of observations | 139 |

Source.—1987 National Survey of the Self-Employed. Own calculations.
Note.—Base: those "seriously intending" to become self-employed in the next few months.

**Table 9**
**Overall Satisfaction with Job: Age 23 in 1981**

| % Answering | Self-Employed | Employees | All Workers |
|---|---|---|---|
| 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 | 8,657 | 9,176 |

SOURCE.—National Child Development Study, 1981.
NOTE.—Base: individuals in employment at the time of interview.

mation, it seems unlikely that there is nothing to be learned from this common message from different surveys. They appear to sit consistently alongside the estimation results.

## VI. 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 nonpecuniary benefit from being their own boss. Hence, some proxy for overall utility is required. We follow the psychology literature in using survey data on job and life satisfaction. It is established there (see, e.g., Warr 1985 and Argyle 1989) that reported satisfaction numbers are highly correlated with observable measures of individual well-being at work such as quitting behavior and physiological symptoms. The small economics literature includes Hamermesh (1977), Freeman (1978), Borjas (1979), Schwochau (1987), Meng (1990), Miller (1990), Clark and Oswald (1994, 1996), 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. The National Child Development Study is again a valuable data source. 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?" (NCDS4 questionnaire, question 19, p. 9). 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 job satisfaction question are coded in the survey into five categories. A cross-tabulation of the results is reported in table

9. Insofar 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" at work. 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 10. Because satisfaction is presumably influenced by income, some stance must be taken on whether or not an 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 employment versus self-employment—and not just the satisfaction level after income is held constant.

Included as controls in the table 10 equations are dummy or continuous variables for self-employment, gender, disabled status, union membership, marital status, region, highest educational qualification, part-time, ever unemployed in the previous 5 years, a dummy for problems with

**Table 10**
**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 | .4235 | 4.930 | .4911 | 5.278 | −.0266 | .106 |
| Female | .1156 | 3.958 | .1311 | 4.189 | .0417 | .470 |
| Disabled | −.1062 | .061 | −.0034 | .019 | −.2521 | .165 |
| Number problems | −.1442 | 2.483 | −.1449 | 2.380 | −.1663 | .795 |
| Married | .0694 | 2.580 | .0786 | 2.711 | −.0074 | .092 |
| Divorced | −.0468 | .367 | −.0831 | .635 | .6753 | .942 |
| Separated | .0778 | .906 | .1085 | 1.178 | −.4742 | 1.808 |
| Part-time | .1290 | 2.095 | .0948 | 1.445 | .4536 | 2.382 |
| Union member | −.0484 | 1.744 | −.0498 | 1.681 | .0177 | .204 |
| Ever unemployed | −.1938 | 7.076 | −.1777 | 6.073 | −.2959 | 3.563 |
| Completed apprenticeship | −.0236 | .556 | −.0143 | .316 | −.0904 | .673 |
| Experience (months) | .0008 | .776 | .0008 | 1.501 | −.0032 | 1.207 |
| Tenure in current job (months) | −.0001 | .016 | −.0001 | .262 | −.0007 | .425 |
| Constant | 2.1924 | 15.007 | 2.1152 | 13.541 | 2.5307 | 5.281 |
| Threshold 1 | .7748 | 28.343 | .7709 | 26.437 | .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 | −9,536.3 | | −8,323.8 | | −1,184.9 | |
| Restricted log likelihood | −9,717.9 | | −8,497.0 | | −1,219.9 | |
| $\chi^2$ (49) | 363.27 | | 346.35 | | 70.048 | |
| N | 7,874 | | 6,887 | | 987 | |

SOURCE.—National Child Development Study, 1981.
NOTE.—Ten region dummies, 4 month-of-interview dummies, 12 highest-qualification dummies, and 9 industry dummies are also included.

arithmetic, months of experience, and job tenure. Month-of-interview dummies are included. A set of industry dummies are also included in table 10. 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 9, self-employment has a positive effect on reported satisfaction levels (one that is quantitatively large). As the equations exclude income measures, the self-employment variables are not capturing merely the nonmonetary 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 marginally less content: this replicates the main finding of the earlier literature of Freeman (1978) and Borjas (1979). Low qualifications (in results not reported) and part-time work are also positively associated with satisfaction—perhaps reflecting the low-aspiration effects discussed in Clark and Oswald (1996).

As an experiment into the effects of access to capital, the data were split into two subsamples. The second set of columns of table 10 is estimated with data on the 6,887 people who reported themselves as having received no inheritance or gift of money or goods exceeding £500. The third set of columns of table 10 gives estimates for the subsample of 987 people who had received this kind of inheritance or gift. There is evidence that the self-employment dummy variable has little 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 might be fruitful.

Table 11 presents related 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" (NCDS5 questionnaire, sec. I, question 8, p. 19). In the life satisfaction equation, a self-employment dummy enters positively.[5] Females and married people

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[5] We have replicated this positive self-employment result in happiness equations for eight other Western countries (Great Britain, Northern Ireland, United States, Italy, Eire, Israel, Norway, West Germany, and New Zealand) using ISSP data for 1991 and for the United States using a time series of cross sections from General Social Surveys, 1972–90 (see app. B). Appendix tables D1 and D2 report

**Table 11**
**Life-Satisfaction Equation: Age 33 in 1991**

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Self-employed | .1101 | .1015 | .1091 | .1114 | .1089 | .1068 |
|  | (2.16) | (2.00) | (2.15) | (2.18) | (2.19) | (2.11) |
| Female | .0861 | .1049 | .1096 | .0971 | .0961 | .1026 |
|  | (2.43) | (3.05) | (3.18) | (2.74) | (2.71) | (2.95) |
| Ever married | ... | 1.1187 | 1.1180 | 1.1132 | 1.0989 | 1.0998 |
|  |  | (25.62) | (25.52) | (25.26) | (24.81) | (25.30) |
| Union member | ... | .0995 | .1085 | .0911 | .0816 | .0929 |
|  |  | (2.74) | (2.98) | (2.48) | (2.20) | (2.55) |
| Race dummies | ... | ... | 7 | 7 | 7 | 7 |
| Qualification dummies | ... | ... | ... | 11 | 11 | 11 |
| Region dummies | ... | ... | ... | ... | 10 | 10 |
| Health dummies | ... | ... | ... | ... | ... | 4 |
| Constant | 7.3385 | 6.3630 | 6.3624 | 6.3096 | 6.3943 | 6.8966 |
|  | (133.12) | (94.97) | (94.65) | (71.87) | (56.11) | (59.84) |
| $\bar{R}^2$ | .0009 | .0739 | .0745 | .0773 | .0790 | .1240 |
| $F$ | 4.78 | 168.16 | 61.85 | 32.04 | 22.75 | 32.40 |
| $N$ | 8,442 | 8,385 | 8,318 | 8,153 | 8,113 | 8,046 |

SOURCE.—National Child Development Study, 1991.
NOTE.—$t$-statistics are 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.

are significantly more satisfied. The union dummy here enters positively, suggesting that such people are happier even if (as in the earlier table 10) they may be less satisfied with their job. It is difficult to know what to make of this difference. Columns 1–6 build up to a specification including personal and regional variables. The finding that the self-employed are happier appears to be robust.

These results provide some evidence that entrepreneurs get higher utility than conventional employees. One caveat should be borne in mind when interpreting this study'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. For example, self-employed people may be intrinsically more optimistic and cheerful than others, or may feel psychologically compelled, because their business is in their own hands, to answer in the way they do. Nevertheless, at this juncture a more straightforward interpretation of the data is that the self-employed really are happier.

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the exact questions asked, the distribution of responses, and 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.

## VII. Conclusions

The forces that affect the supply of entrepreneurship are widely viewed as important but poorly understood. We use survey and microeconometric methods to study a simple class of entrepreneurs, namely, individuals who run their own businesses. We draw upon data from the National Child Development Study, the British Social Attitude Surveys, the International Social Survey Programme, the U.S. 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 such an experiment, the behavior of a group of individuals who are randomly given capital would be compared with the behavior of people in a control group who are given nothing. Such an approach is probably not feasible in a subject like economics. However, a natural experiment in the same spirit is generated by the fact that some individuals receive inheritances and gifts.

In the first part of the article, a theoretical model was constructed in which capital-constrained individuals choose between employment and self-employment. The main idea is a simple one. It is that entrepreneurial projects are, by their nature, difficult for bankers to assess probabilistically. Hence, those bankers are likely to require collateral, and that in turn may hold back potential entrepreneurs. 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 into self-employment[6] 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, 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,

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[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.

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. The 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.[7]

When this research began, a key motivation was to study the impact of psychological traits on entrepreneurship. The NCDS data series is well suited to this task, because it records the outcome of psychological tests that were done during childhood. In practice, however, only one clear correlation could 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, psychology apparently does not play a key role in determining who becomes an entrepreneur.

## Appendix A
## Proofs

### Proofs of Propositions 1 and 2

These are immediate from differentiation of equation 2.

### Proof of Proposition 3

It cannot be the case that $\pi(k^*) + i < w$, because entrepreneurs would leave for the wage sector, which pays $w$. Thus, either marginal entrepreneurial utility, $\pi(k^*) + i$, is equal to $w$, or, because people are held back by capital constraints, it exceeds it. As $\pi(k)$ 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

$$\int_0^{k^*} [\pi(k) + i]\,dk, \tag{A1}$$

and average entrepreneurial utility by

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[7] However, it should be recorded that in recent work Cressy (1996) reaches a different conclusion.

$$\frac{\int_0^{k^*} [\pi(k) + i]\,dk}{\beta Z}. \tag{A2}$$

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

$$v = \frac{\int_0^{\beta Z} [\pi(k) + i]\,dk}{\beta Z} - f'(P - \beta Z), \tag{A3}$$

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

$$\frac{\partial v}{\partial Z} = \frac{1}{Z}[\pi(k^*) + i] - \frac{1}{\beta Z^2} \int_0^{\beta Z} [\pi(k) + i]\,dk + \beta f''(P - \beta Z). \tag{A4}$$

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 using a mean value theorem.

### Appendix B

**Further Data Sources**

#### 1. British Social Attitudes Survey Series, 1983–89

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 1,800 adults; the numbers were increased to 3,000 in 1986. The sampling in each year involved a stratified multistage design with four separate stages of selection. For further details of the survey designs, nonresponses, etc., see Jowell, Witherspoon, and Brook, *British Social Attitudes,* 1983, 1984, 1985, 1986, 1987, 1989, 1990.

## 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 subgroups drawn from this initial sample: past, present, and future self-employed. In this article, 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 4 years, 1983–87, were still self-employed, and had fewer than six employees (243 interviews); and (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 5 years or so. Surveys are currently available for the years 1985–91.

## 4. The U.S. General Social Surveys, 1972–90

The General Social Surveys (GSS) have been conducted by the National Opinion Research Center at the University of Chicago for the years 1972–90. 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 noninstitutional arrangements within the United States.

# Appendix C

## Table C1
## Variable Definitions in the National Child Development Study (NCDS)

| Variable Definitions | Year of NCDS | Description | Mean |
|---|---|---|---|
| 1. Independent variables: | | | |
| *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 | .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: | | | |
| Inheritance/gift | 5 | The value of inheritance or gift received (£) | 1,563.0 |
| Unforthcoming score | 1T | Unforthcoming score: 0 = forthcoming | 1.6839 |
| Hostility score | 1T | Hostility-to-children score: 0 = not hostile | .6715 |
| Acceptance anxiety score | 1T | Anxiety-for-acceptance-by-children score: 0 = not anxious | .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 was a farmer and employer | .0102 |
| Father: farmer own account | 2P | (1,0) dummy if father was a farmer on his own account | .0085 |
| Father: agricultural worker | 2P | (1,0) dummy if father was an agricultural worker | .0117 |
| Father: social class missing | 2P | (1,0) dummy if father's social class was missing | .1650 |
| Regional unemployment rate | 5 | The region's unemployment rate in natural logarithms | 2.0750 |
| Female | 5 | (1,0) dummy if female | .4341 |
| 2. Dependent variables: | | | |
| *a*) NCDS4: | | | |
| Self-employed | 4 | (1,0) dummy if the individual was self-employed in their main occupation in 1991 | .0566 |
| *b*) NCDS5: | | | |
| Self-employed | 4 | (1,0) dummy if the individual was self-employed in their main occupation in 1991 | .1424 |

NOTE.—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.

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## Appendix D

**Table D1**
**Happiness Data from the International Social Survey Programme, 1991**

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

**B. 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 |
| $N$ | 4,548 | 881 |

**C. Ordered Probit Equation for Happiness: ISSP**

|  | Coefficient | Standard Error |
|---|---|---|
| Self-employed | .1042 | .0446 |
| Northern Ireland dummy | .2487 | .0784 |
| United States 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 | −.1777 | .0573 |
| Age 35−44 | −.3256 | .0608 |
| Age 45−54 | −.3242 | .0651 |
| Age 55−64 | −.4438 | .0749 |
| Age 65−74 | .1414 | .1467 |
| Age >75 | −.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 | −4,665.5664 | |
| $N$ | 5,387 | |
| $\chi^2$ (19) | 517.32 | |
| Pseudo $R^2$ | .0525 | |

NOTE.—Excluded categories: Great Britain, <25 years, married. Because of missing values, $N$ is slightly smaller than the sum of 4,548 and 881.

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**Table D2**
**Happiness Data from the U.S. General Social Surveys,**
**1972–90**

**A. 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?"

**B. Responses**

|  | Employees | Self-Employed |
|---|---|---|
| Not too happy | 10.64 | 8.77 |
| Pretty happy | 57.85 | 53.50 |
| Very happy | 31.52 | 37.72 |
| N | 13,238 | 1,983 |

**C. 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 years | −.1900 | .0312 |
| Black | −.3253 | .0293 |
| Other nonwhite | −.0067 | .0677 |
| Years of schooling | .0282 | .0033 |
| Threshold 1 | −1.0829 | .1108 |
| Threshold 2 | .7158 | .1107 |
| Log likelihood | −13,749.05 |  |
| N | 15,221 |  |
| $\chi^2$ (36) | 1,034.08 |  |
| Pseudo $R^2$ | .0369 |  |

NOTE.—Equation also includes 8 region dummies and 16 year dummies. Excluded
categories are single and white.

## Appendix E

**Table E1**
**Gift/Inheritance Equations at Age 23 (NCDS4)**

|  | OLS, Employed (1) | OLS, All (2) | Tobit, Employed (3) | Tobit, All (4) |
|---|---|---|---|---|
| Male | 98.0 | 80.2 | 839.9 | 851.5 |
|  | (1.40) | (1.36) | (1.99) | (2.29) |
| Married | 165.0 | 174.1 | 2,994.3 | 3,055.7 |
|  | (2.32) | (2.97) | (6.83) | (8.02) |
| Mother only dead | 428.5 | 281.5 | 3,713.4 | 2,924.4 |
|  | (2.14) | (1.88) | (3.48) | (3.37) |
| Father only dead | 276.6 | 237.3 | 3,645.7 | 3,183.9 |
|  | (2.15) | (2.43) | (5.15) | (5.52) |
| Both dead | 3,707.6 | 2,494.6 | 7,124.2 | 5,977.8 |
|  | (6.89) | (6.60) | (3.04) | (3.31) |

**Table E1 (*Continued*)**

| | OLS, Employed (1) | OLS, All (2) | Tobit, Employed (3) | Tobit, All (4) |
|---|---|---|---|---|
| Log unemployment rate | −137.2 | −103.8 | −293.8 | −513.6 |
| | (.6) | (.61) | (.22) | (.48) |
| Father's social class (NCDS2): | | | | |
| Employer/manager <25 | −190.0 | −298.3 | −2,453.2 | −2,404 |
| | (.98) | (1.91) | (2.58) | (3.00) |
| Professional, self employed | 550.1 | 254.1 | 3,017.9 | 1,941.9 |
| | (1.34) | (.82) | (1.67) | (1.34) |
| Professional, employee | 302.0 | 109.7 | 243.6 | −186.0 |
| | (1.32) | (.60) | (.22) | (.21) |
| Intermediate nonmanual | −252.7 | −305.8 | −3,413.2 | −2,817.1 |
| | (1.17) | (1.76) | (3.09) | (3.08) |
| Junior nonmanual | −201.6 | −378.4 | −4,355.3 | −4,702.4 |
| | (1.01) | (2.38) | (4.26) | (5.48) |
| Personal service | −103.1 | −410.3 | −4,672.0 | −6,199.1 |
| | (.21) | (1.07) | (1.69) | (2.55) |
| Foremen/super, manual | −595.1 | −694.9 | −7,105.7 | −6,867.2 |
| | (2.78) | (4.06) | (5.91) | (6.85) |
| Skilled manual | −542.2 | −645.5 | −8,233.9 | −7,646.0 |
| | (3.06) | (4.57) | (8.82) | (9.93) |
| Semiskilled manual | −605.3 | −678.4 | −8,618.8 | 8,351.8 |
| | (3.13) | (4.46) | (7.95) | (9.39) |
| Unskilled manual | −665.3 | −769.1 | −10,791.7 | 10,544.7 |
| | (2.85) | (4.34) | (6.84) | (8.51) |
| Own account worker | −191.5 | −362.2 | −4,192.9 | −4,528.2 |
| | (.7) | (1.84) | (3.20) | (4.13) |
| Farmer, employer/manager | 1,337.0 | 1,142.7 | 1,917.4 | 1,941.5 |
| | (3.6) | (3.92) | (1.11) | (1.28) |
| Farmer, own account | −437.8 | −472.0 | −4,006.8 | −2,717.6 |
| | (1.12) | (1.47) | (1.82) | (1.51) |
| Agricultural worker | −625.5 | −715.2 | −9,146.7 | −9,197.2 |
| | (1.81) | (2.66) | (3.88) | (4.62) |
| Armed forces | −546.7 | −589.6 | −4,638.1 | −3,791.9 |
| | (1.51) | (2.07) | (2.31) | (2.37) |
| $N$ | 7,503 | 10,155 | 7,503 | 10,155 |
| $F$ | 6.49 | 5.78 | | |
| $R^2$/pseudo $R^2$ | .0222 | .0245 | .0181 | .0194 |
| $\chi^2$ | | | 398.9 | 547.04 |

NOTE.—Equations also include a constant and 10 region dummies. Columns 2 and 4 include 13 dummies for economic status at time of interview at age 23. *t*-statistics are in parentheses. Excluded category: employer/manager >25.

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