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FINANCIAL CAPITAL, HUMAN
CAPITAL, AND THE TRANSITION TO
SELF-EMPLOYMENT: EVIDENCE FROM
INTERGENERATIONAL LINKS

Thomas Dunn
Douglas Holtz-Eakin

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ABSTRACT

The environment for business creation is central to economic policy, as entrepreneurs are believed to be forces of innovation, employment and economic dynamism. We use data from the National Longitudinal Surveys (NLS) to investigate the relative importance of financial and human capital exploiting the variation provided by intergenerational links. Specifically, we estimate the impacts of parental wealth and human capital on the probability that an individual will make the transition from a wage and salary job to self-employment.

We find that young men's own financial assets exert a statistically significant, but quantitatively modest effect on the transition to self-employment. In contrast, the capital of parents exerts a large influence. Parents' strongest effect runs not through financial means, but rather through human capital, i.e., the intergenerational correlation in self-employment. This link is even stronger along gender lines.

Thomas Dunn
Center for Policy Research
426 Eggers Hall
Syracuse University
Syracuse, NY 13244-1090

Douglas Holtz-Eakin
Center for Policy Research
426 Eggers Hall
Syracuse University
Syracuse, NY 13244-1090
and NBER

1. Introduction

In recent years, the contribution of entrepreneurs to the success of market economies has emerged as a central focus of economic policies. But who becomes an entrepreneur? The determinants of the processes by which individuals enter entrepreneurship, grow and survive, or even depart from an entrepreneurial venture are not thoroughly understood. To the extent that entrepreneurs are of interest, it is essential to understand the individual steps by which people become and remain entrepreneurs.

Because credit rationing can emerge even when all agents optimize (e.g., Stiglitz and Weiss (1981)), one line of inquiry has explored the hypothesis that capital markets constrain entrepreneurs. Viewed from this perspective, an interesting empirical phenomenon is the greater propensity of the offspring of the self-employed to become entrepreneurs. One possible source of this correlation is that successful entrepreneurs may also be more able and willing to transfer financial wealth to their offspring, thereby relaxing capital market constraints. In short, family credit markets may substitute for formal access to funds. However, an alternative explanation is that self-employment is correlated across generations because parents transmit to their offspring valuable experiences or other managerial human capital. After all, the survival process may serve to identify only the better-qualified entrepreneurs. Because policies designed to augment financial capital do not necessarily increase human capital (and *vice versa*), it is essential to distinguish between these potential effects.

Previous research that has focused on liquidity constraints has followed a simple line of reasoning. Initial capital is required for a new enterprise. If individuals are price takers in the credit market, then the ability to obtain capital and start the enterprise will be independent of the entrepreneur's personal finances. However, in cross-sectional work, Meyer (1990) found that this prediction was rejected; the probability of being self-employed increased with an

individual's net worth, *ceteris paribus*. Likewise, Blanchflower and Oswald's (1990) study of British young men indicated that a receipt of a £5,000 inheritance doubled the probability of setting up a business.

Unfortunately, in a cross-section a positive sign on assets could both suggest either that wealth permits entrepreneurship or that entrepreneurs accumulate more wealth. Thus, Meyer (1990) and others have argued that longitudinal data are preferable because explanatory variables may be dated prior to the time of the decision, reducing the chances that the explanatory variables are consequences, not causes, of being self-employed. Using panel data, Evans and Leighton (1989) and Evans and Jovanovic (1989) analyzed transitions to self-employment. In each case, the coefficient on assets was positive and statistically significant, pointing to the presence of liquidity constraints. Meyer (1990) also examined transitions from wage-earning to self-employment and found that from a statistical point of view, assets were significant, but their quantitative impact was quite minor. Finally, in a pair of studies Holtz-Eakin, Joulfaian and Rosen (1994a, 1994b) found that receipt of an inheritance increased the probability of becoming self-employed, raised the capital invested in a new enterprise, enhanced the survival probability of extant sole-proprietors, and increased the gross receipts of existing entrepreneurs. Thus, a general pattern has emerged in which a windfall of capital relaxes capital market constraints and eases the transition to entrepreneurship, but the quantitative impact remains somewhat unsettled.

A second related line of research focuses directly on the intergenerational transmission of labor market status. Recent studies (Altonji and Dunn (1991), Solon (1992) and Zimmerman (1992)) have estimated a larger intergenerational income correlation (about 0.40) than previously documented (e.g., Becker and Tomes (1986)). However, few studies have looked at the underpinnings of these correlations. Altonji and Dunn estimate strong correlations in the work hours, wages and earnings of fathers and sons, and of mothers and daughters. They show also,

among other things, that the probability that a young man belongs to a union is higher when his father is a union member. Looking directly at the question of interest in this study, Lentz and Laband (1990) show that the probability that a young man is self-employed is significantly higher when his father is self-employed.

To summarize, the previous literature suggests a role for both financial and human capital in explaining the intergenerational correlation in self-employment. Our goal is to determine in a more direct way the separate effects of family financial resources and family human capital on the likelihood of a young adult becoming self-employed.

The remainder is organized as follows. In Section 2, we develop the framework for our analysis, while in Section 3 we describe briefly the data used in our analysis. Section 4 analyzes the transition from wage and salary jobs to self-employment. Section 5 summarizes our findings with particular emphasis on the relative importance of financial and human capital.

To anticipate the results, we find that parental human capital has a strikingly large and statistically significant effect upon the propensity to become self-employed. This influence emerges even after controlling for the positive influence of access to capital through the individual and/or his parents, as well as general education. Thus, to the degree that these results correctly characterize the entrepreneurial environment, those policies that provide business-specific human capital will be the most successful in enhancing the entry into self-employment.

2. Framework for Analysis

The model on which we base our empirical work begins by examining a potential new entrepreneur's demand for capital and its interaction with becoming an entrepreneur.[1] We initially abstract from intergenerational or other family links. For each individual, let utility depend on income (Y_i) and a vector (Z_i) of personal characteristics such as those available in our

data: education, race, marital status, number of children, and number of siblings. If earnings ability in a wage and salary job is w_i, assets are A_i and the net rate of return r, then income as a wage-earner is $w_i + rA_i$.

As a self-employed entrepreneur, the individual's gross earnings are $\theta_i f(k_i)\varepsilon$, where $f(\cdot)$ is a production function using capital (k_i), θ_i is the individual's unobserved ability as an entrepreneur and ε is a random element. Ability, θ_i, has a distribution across individuals and is not revealed to the individual until after becoming an entrepreneur. It is also likely influenced by the human capital acquired by the individual from parents and other sources; we return to this below. We assume ε has a mean of one and finite variance, and that ε is independent of θ_i. After investing in the business, the individual has $A_i - k_i$ available to earn capital income, and the individual's net entrepreneurial income is $\theta_i f(k_i)\varepsilon + r(A_i - k_i)$. By definition, if $k_i > A_i$, then $k_i - A_i$ is the amount of capital financed by borrowing. Previous research suggests limits to such borrowing; we summarize any capital market constraints that limit borrowing according to the individual's net assets via a liquidity constraint: $k_i \le l_k(A_i)$.

If the individual becomes an entrepreneur, his optimal amount of capital maximizes expected entrepreneurial income subject to the liquidity constraint. The solution to this problem implies that $k_i^* = g(A_i, \theta_i^e)$, where θ_i^e is the individual's expected ability as an entrepreneur. The impact on k_i^* of changing A_i depends on whether the entrepreneurial venture is liquidity constrained. If so, $k_i^* = l_k(A_i)$, leading directly to $\dfrac{dk_i^*}{dA_i} = l_k'(A_i) > 0$. Otherwise, $\dfrac{dk_i^*}{dA_i} = 0$. These predictions form the basis of tests for liquidity constraints.

So far we have discussed behavior conditional on being an entrepreneur. The individual cannot know for sure his fortunes as an entrepreneur, both because he is not able to forecast business conditions and due to uncertainty about his ability. He will, however, opt for entrepreneurship if expected utility is higher in that setting. That is, if

$$E\{U([\theta_i f(k_i^*)\varepsilon + r(A_i - k_i^*)]; Z_i)\} > E\{U([w_i + rA_i]; Z_i)\}.$$ (1)

As (1) indicates, the decision to become an entrepreneur depends on relative (expected) ability in each mode, resources, and tastes. This suggests an empirical implementation of the form:

$$p_{it} = p(Z_{it}, w_{it}, A_{it}, \theta_{it}^e, \mu_{it}),$$ (2)

where p_{it} is the probability that individual i becomes self-employed during year t and μ_{it} is a stochastic error term.

One would expect parental linkages to affect the decision-making process in two ways. First, it is possible that the offspring of wealthy parents have better access to capital assets through the influence of their parents' wealth.[2] If so, it suggests that equation (2) should include parents' assets as well as the individual's assets. That is,

$$p_{it} = p(Z_{it}, w_{it}, A_{it}, A_{it}^P, \theta_{it}^e, \mu_{it}),$$ (3)

where A^P denotes parents' assets.

As noted above, financial capital is only one possible intergenerational linkage. Lentz and Laband (1990, 1993) and others have argued that the probability that an individual is self-employed increases if his or her parents were also self-employed. This propensity may derive from similarities among family members in attitudes or preferences for autonomy, or the transmission of human capital (general managerial expertise or job-specific knowledge). Moreover, there may be other attributes of families—hard-working, disciplined, independent, etc.—that will be correlated both with family wealth and with the probability of becoming self-employed. In these circumstances, a finding that parental wealth "matters" may reflect not the role of access to capital, but rather the value of this human capital.

In terms of the formal model, ability (θ) may be influenced by parents' experiences as self-employed entrepreneurs. Expanding our specification to accommodate this feature yields:

$$P_{it} = p(Z_{it}, w_{it}, A_{it}, A_{it}^P, \theta_{it}^e, \theta_i^p, \mu_{it}) \quad . \tag{4}$$

In our empirical work below, access to matched family member data allows us to exploit these links between children and their parents, permitting more reliable estimates of the impact of human and financial capital as determinants of entrepreneurship.

To transform (4) into a form suitable for statistical analysis requires that we make some assumptions regarding the properties of the error term, μ_{it}. We assume that the μ_{it} are distributed according to a Weibull distribution, yielding the conventional logit statistical model.

3. Data

Our data are drawn from the National Longitudinal Surveys of Labor Market Experience (NLS). Specifically, we work with the samples of young men who were aged 14 to 24 in 1966, mature women who were aged 30 to 44 in 1967, and the sample of older men who were aged 45 to 59 in 1966. The young men were surveyed 12 times between 1966 and 1981, while the older men were surveyed 11 times over the same period. The mature women were also surveyed 11 times through 1982, the last year of their data we use. We restrict our analysis to the subset of young men who can be matched to a parent in either of the older cohorts.[3] We further restrict our attention to observations for young men to years in which they were not enrolled in school and did not return to school in a subsequent year. We keep observations for the parents in the older cohorts until the parent reaches age 65 or first reports being retired.[4]

3.1 Self-Employment in the NLS

To gain a feel for our data, we present a preliminary look at the propensity for self-employment as revealed by the NLS. We count an individual as self-employed in a particular survey year if his "class of worker" category for the current or most recent job is "own farm or business," incorporated or otherwise.[5] For parents, we have a class of worker report for whichever parent is a member of the older NLS cohorts. We lack a direct report of whether the parent's spouse is self-employed, so we rely on an affirmative response to whether the spouse had income from a farm, business or professional practice. Table 1 shows selected year-by-year rates of self-employment for the three groups in our data.[6]

As shown in the first column of the table, the rate of self-employment for sons rises steadily as the cohort ages. The rate increases from 2 percent in 1966 to 15 percent in 1981. Also shown at the bottom of the table are several measures of the overall propensity toward self-employment. Using these measures, 18 percent of the sons reported being self-employed at least once during the 1966-1981 period, with the mean age of first self-employment being roughly 27 years. Using a slightly different metric that captures intensity of self-employment, on average 8 percent of the working years of sons in the sample were devoted to self-employment. This computation includes, however, those who were never self-employed. Restricting the sample to those (18 percent) who reported self-employment at some point during the sample, the fraction of time devoted to self-employment rises to 43 percent. In short, self-employment experiences are an important aspect of the careers of young men. Self-employment touches nearly one-fifth of the sons, occupying nearly one-half of their early careers.

The next two columns report our self-employment measures for the parents. Not surprisingly, self-employment rates are higher and more stable among the fathers, rising only from 22 percent to 24 percent over the period. Equally unsurprising, these rates exceed those

among mothers, which range from 5 percent to 9 percent.[7] Measuring the incidence from a broader perspective, 30 percent of the fathers and 16 percent of the mothers experience at least one year of self-employment over the survey years. Moreover, fathers who are ever self-employed spend nearly three-quarters of their working time during the survey period in that state. The summary provided in Table 1 leaves little doubt as to the substantial self-employment activity among both the sons and their mature parents in the sample.[8]

3.2   Intergenerational Links in Self-Employment

Table 1 views the self-employment experiences of sons and parents in isolation. Table 2 presents the first steps toward analyzing the intergenerational linkages by presenting the self-employment rates of sons based upon the self-employment histories of their parents. Consider, for example, the entries for 1971 shown in the second row of the table. The entries show that 7 percent of those sons whose fathers were ever self-employed were themselves self-employed in 1971. In contrast, among sons whose fathers were not ever self-employed during the survey, the rate was only 4 percent. Of course, a father's self-employment is not the only possible source of intergenerational links; the next two columns display similar comparisons using mothers' self-employment experiences as the key event. As shown, in 1971 the self-employment rate among sons of mothers with self-employment experience (6 percent) is twice as high as for those sons whose mothers were not self-employed (3 percent). Moreover, there is nothing special about 1971 in this regard. A similar pattern prevails in each of our selected survey years.

The differences are even more striking using our broader measure of the incidence of self-employment. For example, among the sons of self-employed fathers, 32 percent experienced some self-employment, compared with only 12 percent for the other sons. A similar, if

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quantitatively less dramatic, difference prevails among the sons whose mothers had different labor force experiences.[9]

One possible concern is that the apparent intergenerational linkage in self-employment is instead an artifact of sons following in their parents' occupations. It may be that some occupations are characterized by greater self-employment (e.g., doctors, plumbers, farmers). If occupational following is strong in these professions, then our intergenerational rate of following in self-employment may simply mirror the occupational following rate. The data, however, reveal little support for this possibility. Among sons who became self-employed, 10 percent entered into the same occupation as their fathers.[10] This is virtually identical to the 10.3 percent occupation following rate for sons who did not become self-employed. Stated differently, 90 percent of self-employed sons entered occupations other than that of their fathers.

Another possible concern is that our self-employment linkages reflect family businesses. The data do not allow us to directly identify self-employment resulting from entering an existing family business. A reasonable assumption is that a son who inherits or enters a family business enters self-employment with the same occupation and industry classifications as his father. Using this definition (and very broad industry and occupational classifications), only 10 percent of sons who became self-employed would be classified as entering a family business. (This compares to an industry-and-occupation following rate of 4.6 percent for sons who never became self-employed.)[11]

Thus, the pattern of self-employment rates appears not to derive from either similar occupations or, more directly, from family businesses. Instead, Table 2 reveals that in any given year the self-employment rate for sons is much higher whenever either parent has a history of self-employment than otherwise. Also, using "any self-employment" as our measure of the incidence of self-employment summarizes the overall tendency quite well. On the whole, this

self-employment measure is on the order of twice as high whenever a parent has been self-employed. The final rows of the table indicate that father's experiences also raise the intensity of self-employment (fraction of years spent self-employed conditional upon self-employment) and lowers by 1.5 years the age at which self-employment begins.[12] As a bottom line, the table displays clearly the positive intergenerational correlation in self-employment and emphasizes the greater propensity to become self-employed at all, i.e., on the entry into self-employment.

A final piece of suggestive evidence comes from looking at brothers in the NLS, where we find that the strong positive influence of parents' self-employment is common to brothers. In Table 3 we divide our sample based on the number of brothers, and compare the prevalence of self-employment within families based on the parents' self-employment experience. Consider, for example, the families shown in the middle section of the table, each of which contributed two sons to our data. In the 259 families where neither parent was self-employed, one of the two sons was self-employed in only 12.0 percent of the cases, and both sons were self-employed in only 3.5 percent. In contrast, the corresponding computations for the families where parents had self-employment experience are 28.2 percent and 16.1 percent, respectively. A similar pattern of higher prevalence rates show up in families with three sons, as well.[13] In short, sons are more likely to be self-employed and more sons are likely to be self-employed in families where a parent had some self-employment experience.

3.3 Self-Employment and Intergenerational Access to Wealth

Previous research has highlighted the role of access to capital in augmenting transitions to self-employment. One might conjecture that those parents who survive as entrepreneurs may have greater access to financial capital and are able to influence their children's employment choices by example or by providing start-up capital. Indeed, the self-employed parents in our

sample are wealthier than their counterparts. Their mean (median) non-business assets are $49,000 ($31,500), which are substantially larger than the corresponding values of $33,700 ($21,600) for the never-self-employed parents. Moreover, if we cast the net more widely and include business assets and liabilities, the difference in the means (and the medians) triples. Hence, in parallel with our focus on human capital, it is useful to focus briefly on the pattern of self-employment and wealth accumulation in the NLS.

We show in Table 4 the links across generations in assets and self-employment. Specifically, we show the propensity for self-employment among sons based upon the location of their *parents* in their wealth distribution. Under the hypotheses that children have access to their parents' wealth, and that greater financial assets enhance the transition to self-employment and survival of new businesses, one would expect to find a positive relationship between parents' wealth and self-employment among children.

Consider panel (a), in which entries indicate the fraction of sons who are self-employed in the given year according to the net asset holdings of their parents.[14] As the panel indicates, in each year there is a moderate positive relationship between self-employment and parental wealth, with the largest effect concentrated in the difference in self-employment rates for the sons whose parents are in the third versus the fourth quartile of the total asset distribution.

A potential concern about the computations in panel (a) is that parents' assets may be dominated by their ownership of businesses. If so, the self-employment among sons may reflect more the assumption of responsibility for a family business, and less the role of parents' assets in relaxing liquidity constraints. As discussed earlier, the data do not suggest a strong role for family businesses in the self-employment process. Nevertheless, we control for this possibility by removing all business assets and liabilities from our parental wealth measure. The results of this procedure are shown in panel (b) of the table. Although the relationship is noisier, the

positive relationship between parents' assets, especially in the upper tail, and son's self-employment survives virtually unchanged.

3.4   Multivariate Analyses

Thus far, we have examined the influences of parental human and financial capital in isolation. However, the discussion surrounding equation (4) emphasizes the importance of personal characteristics (Z_{it}), as well as the role of the sons' financial and human capital. What data are available regarding these attributes? NLS respondents answer a wide variety of labor market, demographic and family structure questions in each survey year, providing us with rich panel data for both sons and parents. We employ a standard set of demographic variables: age, race, marital status, number of dependents, number of siblings, whether the individual lives in the South or in an SMSA, and spouse's income.

We proxy human capital through the use of age and education measures. Specifically, we use yearly enrollment and highest grade completed reports to construct a measure of educational attainment (a series of indicator variables for less than high school, high school graduate, some college, college graduate, and post college). Descriptive statistics for our data are shown in Table 5.

With these data at our disposal, we may examine the degree to which the positive correlations with parents' self-employment and wealth survive a multivariate analysis. In conducting our analysis, we analyze transitions from wage and salary employment to self-employment. As noted at the outset, focusing on transitions rather than the probability of self-employment *per se* eases concerns regarding the simultaneity of asset accumulation and entrepreneurship in a cross-section by including variables that are dated at a time prior to the entry into self-employment. We begin with a specification that focuses on the young men's own

financial assets and human capital (age and education), and then successively augment the equation with variables capturing the potential contributions of their parents' financial and human capital.

4.   Determinants of Transitions to Self-Employment

In our sample, the annual transition rate from a wage and salary job to self-employment is 3.1 percent.[15] We begin our analysis of this process using the baseline estimate shown in column (1) of Table 6. In addition to the variables shown, this (and all other) specification includes the following control variables: year dummy variables, four indicators of educational attainment, age, age squared, number of siblings, number of dependents, spouse's earnings, and indicators for black, married, residence in an SMSA and residence in the south. The Appendix shows the entire baseline specification.

We begin in column (1) by replicating previous work showing the link between individuals' assets and transitions to self-employment. In our sample, the effect of the young man's own assets (measured in thousands of dollars) on the transition into self-employment is estimated to be 0.0078, with a p-value of 0.002.[16] This coefficient implies that a $10,000 increase in own assets raises the probability of entering self-employment by 0.0015, a finding consistent with the literature indicating the limited importance of capital market constraints on the entry into entrepreneurship.[17]

We turn next to the role of parents' variables on sons' transitions into self-employment. Columns (2) to (4) focus on financial assets. The second column shows the results of augmenting the baseline specification with parents' net-of-business assets. These assets enter with a coefficient (p-value) of 0.0037 (0.027) suggesting a positive link. Using total assets instead of non-business assets (column 3) gives a slightly stronger and more significant estimate.

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The larger coefficient on total assets confirms our expectation that parent's business assets might be more strongly related to their son's self-employment plans. Still, even if one accepts this estimate the overall impact is not great. To get a sense of magnitudes, a $10,000 increase in parents' total assets raises the probability of a son's transition into self-employment by 0.0009, which is small relative to both the sample transition probability of 0.031 and the sons' own-asset impact.

One possibility is that the evolution of parents' assets may be influenced by sons' transitions to self-employment; i.e., it may be the case that parents' assets may be endogenous. To control for the possibility, in column (4) we measure parents' assets in 1966, rather than in the contemporaneous year. We choose 1966 because it is the beginning of the survey period. The sons are quite young or still in school, thus lessening the possibility that parental asset accumulation is driven by the children's business plans. Although the logit coefficient is larger, the marginal effect of parents' assets remains small.

We turn next to investigating the role of human capital. These results are presented in the remaining columns of Table 6. In column (5) we consolidate the self-employment experiences of the parents into a single variable, PARENTS, our indicator for whether either parent was ever self-employed over the survey years. As shown in column (5), the strong correlation evident in Table 2 survives; the variable has a strong positive effect when entered by itself. Moreover, the statistical significance of parental human capital remains intact in a multivariate analysis even when it is entered along with their net-of-business assets (column (6)) or their total assets (column (7)).

At the same time, including PARENTS reduces the positive effect of parents' assets. Thus, the temptation to ascribe positive intergenerational correlations in self-employment to financial sources may be misleading. However, financial capital is not entirely unimportant;

witness that the sons' own asset effect is unchanged. How large is the parents' human capital effect? Using the results from column (5) and holding the son's characteristics at the mean values, switching the parents' self-employment indicator from zero to one raises the probability of a transition from 0.016 to 0.031, an increase of 0.015, which is quite large compared to the sample transition probability of 0.031.[18]

In short, parents' assets exert a positive, but quantitatively small influence on sons' self-employment. On the other hand, parents' self-employment experience has very large and significant effects, just about doubling the probability of the son's entering self-employment.

The final column of the table permits separate influences of fathers' self-employment and mothers' self-employment on their sons. Why might we expect these effects to be different? One possibility is that sons observe and take as their example the labor supply of the parent with the stronger labor force attachment. In these cohorts, the older men's labor force participation is on average much higher than the women's, so we would expect the father's effect to be stronger. Another possibility is that, given the relative infrequency of female self-employment, it may be the case that a mother's self-employment has a disproportionate effect on the children. If so, we would expect that it would show up as a stronger predictor of son's self-employment propensity than would the father's self-employment.

To examine these conjectures we decompose the PARENTS variable into the variables FATHER, MOTHER, and BOTH. These indicate, respectively, whether the father only, mother only, or both parents were ever self-employed. The results show that in isolation fathers have a strong influence and mothers a weak influence on son's self-employment. However, having two self-employed parents has the strongest effect.[19]

4.1   Alternative Specifications

These results suggest a very important role for parents' human capital and a modest role for parents' financial capital, but a smaller effect of sons' own assets than found in some previous studies. One possibility is that the ability to control for the parents' role in the transition to self-employment leads to these smaller effects. Alternatively, they may derive from our choices regarding estimation and specification. To investigate this, we first checked the statistical foundations by assuming probit and linear probability model specifications. The choice of statistical model had little effect on the basic character of the results. (Estimates are available from the authors.) Next, we relaxed the linear specification of sons' assets by adopting a quadratic specification, with little effect. (The implied increase in the transition probability associated with a $10,000 increase in assets is 0.0018, which compares to 0.0015 calculated from the linear specification.) In addition, we permitted a negative asset position to have a different effect than positive assets, but no significant difference was found.

Thus, we find our estimates to be robust to several alternative specifications. This suggests that the inability to control for parents' financial and human capital may impart an upward bias to previous estimates. With the exception of Holtz-Eakin, Joulfaian, and Rosen (1994a, 1994b) and Fairlie (1994) few previous studies have been able to include controls for parents' entrepreneurship.

Another possibility is that the significance of parents' self-employment does not reflect the transmission of skills or other aspects of human capital, but rather the convergence of tastes for autonomy or a self-employment lifestyle. Notice, however, that if the correlation reflects the transmission of skills, one would expect that more highly-skilled, successful parents would have a larger impact on their son's transition. In contrast, if the main effect is observing self-

employment *per se*, one would not expect variations in parental success to be important, once we have controlled for their self-employment.

To discriminate between these alternatives, we measured parental "success" in two ways: as the average value of self-employment income during the period observed in our data and as the average value of business assets during the sample period. Either greater flows of income or greater accumulation of business capital are both indicative of successful self-employment. We then augmented our transition equation with a variable computed as the interaction of our indicator for any parental self-employment (*PARENTS*) and the measure of success. In both cases, the interaction variable is positive and statistically significant. That is, using either business income or assets as a measure of success, one finds that sons of more successful entrepreneurs are more likely to enter self-employment than sons of less successful entrepreneurs, conditional upon the common tastes and so on, captured by the parents' self-employment indicator itself.

5. Summary

Recent research has focused on the importance of liquidity constraints and human capital accumulation in the determination of self-employment. Clearly, the intergenerational transmission of parental financial assets and job market experiences is a potentially crucial aspect of the process the generates and sustains entrepreneurs. Our investigation of data from the NLS suggests important roles for intergenerational transfers of financial and, especially, human capital. Specifically, the results reported above indicate that the financial assets of young men exert a statistically significant, but quantitatively modest effect on the transition into self-employment. Using this as our metric, we find a relatively small impact of capital market constraints in the NLS.

In contrast, parents exert a large influence. While parental wealth *per se* has a small positive effect on the transition for sons, the strongest parental effect does not run via financial channels. Rather the most dramatic influence occurs through intergenerational correlation in self-employment that runs most strongly along gender lines. Thus, these data suggest strong roles for human capital *per se* and the transmission of these skills within families in enhancing the probability of making a transition to entrepreneurship.

Table 1: Self-Employment Rates in the NLS Matched Parent-Son Samples

	NLS		
Indicator	Sons	Fathers	Mothers
Year-Specific Self-Employment Rates			
1966	0.02 [412]	0.22 [1290]	0.05 [2080]
1971	0.04 [1040]	0.22 [984]	0.08 [1087]
1976	0.10 [1968]	0.23 [594]	0.08 [941]
1981	0.15 [1554]	0.24 [222]	0.09 [874]
Overall Propensity for Self-Employment			
Any self-employment during survey years?	0.18 [2363]	0.30 [1294]	0.16 [2125]
Age first self-employed	26.8 [371]	na	na
Fraction of years spent self-employed			
Overall	0.08 [2363]	0.22 [1293]	0.07 [2125]
Conditional on any self-employment	0.43 [371]	0.72 [365]	0.43 [302]

Notes: All figures have been weighted to population means. Self-employment rates are conditional upon working at all. Numbers in brackets are sample sizes for each computation. NLS sons are aged 14 to 24 in 1966 and must have completed schooling; fathers are aged 45 to 59 in 1966 and must be younger than 66 and not previously have reported being retired; and mothers are aged 30 to 44 in 1967.

Table 2: Intergenerational Links in Self-Employment

| | Sons' Self-Employment Rate | | | |
| | Father | | Mother | |
Indicator	Self-Employed	Not Self-Employed	Self-Employed	Not Self-Employed
Year-Specific Self-Employment Rates				
1966	0.05	0.00	0.00	0.02
	(0.21)	---	(0.00)	(0.15)
	[64]	[151]	[31]	[86]
1971	0.07	0.04	0.06	0.03
	(0.26)	(0.19)	(0.24)	(0.16)
	[150]	[355]	[100]	[527]
1976	0.18	0.05	0.12	0.08
	(0.38)	(0.23)	(0.32)	(0.28)
	[173]	[426]	[118]	[647]
1981	0.28	0.09	0.21	0.11
	(0.45)	(0.28)	(0.41)	(0.32)
	[201]	[501]	[145]	[832]
Overall Propensity for Self-Employment				
Any self-employment during survey years	0.32	0.12	0.19	0.13
	(0.47)	(0.32)	(0.40)	(0.34)
	[292]	[746]	[221]	[1306]
Age first self-employed	26.0	27.5	26.0	26.4
	(4.68)	(4.94)	(4.57)	(4.25)
	[94]	[87]	[43]	[171]
Fraction of years spent self-employed				
Overall	0.16	0.04	0.08	0.06
	(0.28)	(0.14)	(0.20)	(0.18)
Conditional on any self-employment	0.48	0.37	0.42	0.43
	(0.30)	(0.23)	(0.24)	(0.28)

Notes: Self-employment rates are conditional upon working at all and are unweighted. Numbers in parentheses are standard deviations; those in brackets are sample sizes. "Sons" are aged 14 to 24 in 1966 and must have completed schooling. "Fathers" are aged 45 to 59 in 1966 and must be younger than 66 years old and not previously have reported being retired. "Mothers" are aged 30 to 44 in 1967.

Table 3. Prevalence of Self-Employment among Brothers

Number of Sons Observed in NLS	Number of Self-Employed Sons	Percent of Families with This Number of Self-Employed Sons	
		Parents Not Self-Employed	Parents Self-Employed
		N=923	N=416
1	0	88.9	74.5
	1	11.1	25.5
		N=259	N=124
	0	84.6	55.6
2	1	12.0	28.2
	2	3.5	16.1
		N=41	N=16
	0	78.0	43.8
3	1	19.5	25.0
	2	2.4	18.8
	3	0.0	12.5

Notes: Sample is restricted to sons who have completed schooling and worked at least one year. "N" indicates sample size.

Table 4: Parents' Assets and Self-Employment of Sons

	(a) Parents' Total Assets					(b) Parents' Non-Business Assets			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4		Quartile 1	Quartile 2	Quartile 3	Quartile 4
1966	0.00 (0.00) [7]	0.00 (0.00) [4]	0.00 (0.00) [10]	0.29 (0.49) [7]		0.00 (0.00) [7]	0.20 (0.45) [5]	0.00 (0.00) [111]	0.20 (0.45) [5]
1971	0.00 (0.00) [76]	0.02 (0.15) [94]	0.05 (0.22) [101]	0.09 (0.29) [117]		0.03 (0.16) [75]	0.05 (0.21) [86]	0.06 (0.24) [103]	0.05 (0.23) [112]
1976	0.03 (0.18) [124]	0.07 (0.26) [126]	0.08 (0.28) [169]	0.14 (0.35) [188]		0.06 (0.23) [126]	0.09 (0.29) [127]	0.07 (0.26) [153]	0.11 (0.31) [190]
1981	0.05 (0.21) [129]	0.13 (0.34) [156]	0.15 (0.35) [192]	0.25 (0.43) [208]		0.12 (0.32) [130]	0.14 (0.35) [145]	0.15 (0.35) [179]	0.21 (0.41) [207]

Notes: Sample restricted to sons who have completed school. Entries show estimated self-employment rate, standard deviation of self-employment rate (in parentheses) and number of observations (in brackets). Assets are measured net of liabilities.

Table 5: Characteristics of Sons
Mean (Std Dev)

Variable	Whole Sample	Never Self-Employed	Self-Employed at Least Once
AGE FIRST YEAR IN SAMPLE	21.8 (3.78)	21.8 (3.80)	21.8 (3.66)
EDUCATION LESS THAN HS	0.24 (0.43)	0.25 (0.43)	0.19 (0.39)
HIGH SCHOOL GRADUATE	0.38 (0.48)	0.38 (0.49)	0.35 (0.48)
SOME COLLEGE	0.19 (0.40)	0.19 (0.39)	0.21 (0.41)
COLLEGE GRADUATE	0.11 (0.32)	0.11 (0.31)	0.15 (0.35)
POST-GRADUATE	0.08 (0.27)	0.07 (0.26)	0.11 (0.31)
NUMBER OF SIBLINGS	3.64 (2.66)	3.73 (2.74)	3.15 (2.13)
NUMBER OF DEPENDENTS	0.39 (0.50)	0.38 (0.50)	0.43 (0.51)
BLACK	0.32 (0.47)	0.36 (0.48)	0.13 (0.33)
SMSAN (=1 if SMSA, non-central city)	0.32 (0.39)	0.31 (0.39)	0.35 (0.39)
SMSAC (=1 if SMSA, central city)	0.35 (0.40)	0.37 (0.41)	0.26 (0.35)
SOUTH (=1 if in south)	0.43 (0.47)	0.45 (0.47)	0.33 (0.45)
MARRIED?	0.41 (0.30)	0.40 (0.30)	0.49 (0.30)
ANYSE (ever self-employed?)	0.16 (0.37)	0.00	1.00
PARENTS (parent ever self-employed?)	0.30 (0.46)	0.26 (0.44)	0.46 (0.50)
Panel Means			
AGE	23.9 (4.30)	24.0 (4.33)	23.3 (4.08)
ASSETS	8.52 (23.16)	7.88 (19.58)	12.31 (37.69)
PASSETS ($1000s)	42.21 (55.51)	39.00 (51.99)	61.05 (69.97)
SPOUSE'S EARNINGS ($1000s)	2.24 (4.94)	2.24 (4.90)	2.27 (5.19)
Number of observations	3173	2711	462
Number of individuals	1188	997	191
Mean Number of obs/individual	5.34	5.43	4.81

Notes: Sample limited to young men who can be matched to a parent in one of the older NLS cohorts. Observations are included only for those years when the son is not enrolled in school and did not return to school in a subsequent year.

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Table 6: Parents' Financial Capital, Parents' Human Capital and the Transition to Self-Employment

	(1)	(2)	(3)	(4)*	(5)	(6)	(7)	(8)
ASSETS (own non-business assets)	0.0078 (0.002) [0.00015]	0.0073 (0.006) [0.00014]	0.0075 (0.006) [0.00014]	0.0093 (0.005) [0.00015]	0.0080 (0.001) [0.00015]	0.0076 (0.002) [0.00014]	0.0077 (0.002) [0.00014]	0.0073 (0.002) [0.00013]
NPASSET (parents' non-business assets)		0.0037 (0.027) [0.00007]		0.0066 (0.002) [0.00011]		0.0029 (0.078) [0.00005]		0.0031 (0.061) [0.00006]
TPASSET (parents' total assets)			0.0048 (0.000) [0.00009]				0.0039 (0.000) [0.00007]	
PARENTS (either parent self-employed?)					0.7027 (0.002) [0.01539]	0.6484 (0.005) [0.01387]	0.4727 (0.054) [0.00959]	
FATHER (only father self-employed)								0.6048 (0.023) [0.01336]
MOTHER (only mother self-employed)								0.0482 (0.925) [0.00090]
BOTH (both parents self-employed)								1.1157 (0.003) [0.03432]
N (observations)	3173	3173	3173	2811	3173	3173	3173	3173
Sample Probability	0.031	0.031	0.031	0.029	0.031	0.031	0.031	0.031

Note: Each equation also includes year-specific intercepts, age, age squared, four education dummies, number of dependents, spouse's earnings, and indicator variables for black, region, SMSA residence, and marital status. Entries are estimated logit coefficients. Figures in parentheses are p-values for significance of estimates based on Huber-White standard errors. Marginal effects of each variable (evaluated at sample means) are shown in brackets.

* In column (4) parents' assets are measured in 1966 (the start of the sample period).

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Appendix Table: Baseline Estimates of Probability of Transition to Self-Employment

CONSTANT	-9.2095 (0.006) [-0.17915]	SPOUSE EARNINGS	0.0168 (0.435) [0.00033]
AGE	0.4359 (0.120) [0.00848]	BLACK	-1.1938 (0.033) [-0.02322]
AGE SQUARED	-0.0086 (0.134) [-0.00017]	SMSAN (=1 if SMSA, non-central city)	-0.0515 (0.853) [-0.00100]
LESS THAN HIGH SCHOOL	0.5824 (0.081) [0.01133]	SMSAC (=1 if SMSA, central city)	-0.5526 (0.065) [-0.01075]
SOME COLLEGE	0.0220 (0.947) [0.00043]	SOUTH (=1 if in south)	-0.3235 (0.265) [-0.00629]
COLLEGE GRADUATE	0.2856 (0.450) [0.00556]	MARRIED?	-0.1616 (0.630) [-0.00314]
POST-GRADUATE	0.5439 (0.145) [0.01058]	ASSETS (own non-business assets)	0.0078 (0.002) [0.00015]
NUMBER OF SIBLINGS	0.0358 (0.476) [0.00070]	N (observations)	3173
NUMBER OF DEPENDENTS	-0.0492 (0.739) [-0.00096]	Sample Probability	0.031

Notes: Specifications also include year dummies. Entries are estimated logit coefficients. Figures in parentheses are *p*-values for significance of estimates based on Huber-White standard errors. Marginal effects of each variable (evaluated at the sample mean) are shown in brackets.

Notes

1. See Evans and Jovanovic (1989) or Holtz-Eakin, Joulfaian, and Rosen (1994a).

2. Altonji, Hayashi, and Kotlikoff (1992) examine resource sharing within extended families. Cox (1990) and Cox and Jappelli (1990) find that intergenerational cash transfers are targeted toward liquidity constrained individuals. Englehardt and Mayer (1995) find that cash transfers from parents allow home buyers to afford larger down payments, purchase earlier and buy a larger home.

3. There are two possible ways to match fathers' information to sons' records. First, the father may appear in the older men's sample. Alternatively, the sons' mothers may be in the mature women sample. If so, we rely on the mothers' report of her husband's information. Similar rules apply to matching mothers and sons.

4. It is not obvious how eliminating observations for individuals based on retirement affects the measured prevalence of self-employment. Fuchs (1982) shows that the self-employed retire later than the non-self-employed and that many people become self-employed after retiring from a wage and salary job. The first effect would tend to raise measured self-employment, while our age and retirement restrictions will exclude the switchers and lower our measure of self-employment.

5. Survey participants were not asked about dual jobs in every survey year. Hence, we are unable to gauge the importance of self-employment as a secondary job or of part-time self-employment .

6. We employ the NLS-provided weights to provide population estimates.

7. Devine (1994) studies the recent growth in female self-employment rates.

8. A natural question arises as to whether the NLS reports of self-employment are indicative of self-employment in the population as a whole. To shed some light on this issue, we present (below) the self-employment rates for similarly defined age groups calculated from the March Current Population Survey (CPS) in the corresponding years. While the cross-sectional nature of the CPS precludes checking for transitions related to schooling and retirement in the same fashion as in the NLS, the rates are sufficiently close to suggest that the incidence of self-employment in the NLS is quite close to that in the population as a whole.

CPS Self-Employment Rates

Year	"Sons"	"Fathers"	"Mothers"
1971	0.04	0.17	0.05
1976	0.07	0.18	0.05
1981	0.10	0.22	0.08

9.   For each pair of columns, t-tests reject at conventional significance levels the hypothesis that the "any self-employment" rates are equal.

10.   We use NLS-provided classifications of 12 different occupational categories.

11.   Lentz and Laband (1990) found that 26.5 percent of second-generation proprietors had inherited or bought a family business.

12.   In Lentz and Laband's (1990) sample of self-employed men, second-generation proprietors on average entered self-employment 1.9 years earlier than first-generation proprietors.

13.   In each case, a chi-square test rejects (at the 0.01 level of significance) the null hypothesis that the prevalence rates are equal for families where parents were and were not self-employed. We exclude families with four or more brothers due to small samples.

14.   In five of the survey years, detailed questions were asked about the value of household assets and liabilities including the value of savings accounts, stocks, bonds and mutual funds, residence and real estate market value and liability, and farm and business market value and liability. In addition to the reported total net value of assets, we construct another measure that excludes farm and business assets and liabilities. In each case we exclude a handful of extreme observations at each end of the asset distribution. In order to more fully exploit the panel aspect of the data, we interpolate an asset value for every survey year between each two consecutive asset reports. All dollar values have been converted to 1982-84 dollars using the Consumer Price Index. We do this for parents' assets and for sons' assets. See Dunn and Holtz-Eakin (1995) for additional details regarding the measurement of net assets.

15.   This is very close to Fairlie's (1994) estimate of the transition probability of 3.3 percent for men in the PSID.

16.   The p-values are based on standard errors that are corrected using Huber's formula to account for the fact that there are multiple observations per person in the dataset.

17.   Fairlie (1994) uses a net-of-business asset measure similar to ours and finds that a $10,000 increase at the mean raises the probability of a transition by 0.005. Using asset variation generated by the receipt of an inheritance, Holtz-Eakin, Joulfaian, and Rosen (1994b) find a substantial effect: a $100,000 inheritance raises the annual transition probability by 0.00825. In contrast, Meyer (1990) finds that an additional $100,000 of net worth raises the transition probability by only 0.00017.

18.   Fairlie (1994) finds similar strong effects—father's self-employment raises the son's transition probability at the mean by 53 percent.

19.   We ran a parallel analysis for the young women's cohort of the NLS and found that the MOTHER effect is strongest for daughters, 2.122 (p-value= 0.0001), but the FATHER and BOTH are also strong and significant, 1.238 (0.001) and 1.775 (0.001), respectively. These results are largely consistent with those of Altonji and Dunn (1994) who find strong similarities in the work hours of parents and children that run along gender lines

and that they may be traced to intergenerational correlations in work preferences rather than to labor supply responses to similarities in wages. The evidence here is that entrepreneurial tastes or abilities are also passed along in families from parents to children of the same gender.

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