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

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Financial Capital, Human Capital, and the Transition to Self-Employment: Evidence from Intergenerational Links

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 family financial and human capital in the transition into self-employment. Specifically, we estimate the impacts of own wealth and human capital and parental wealth and self-employment experience on the probability that an individual makes 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 their own self-employment experience and business success. This link is even stronger along gender lines.

1 Introduction

In recent years, self-employment and other aspects of entrepreneurship have emerged as a focus of economic policies. However, the determinants of entry into self-employment, and the growth, survival, or departure from such a venture are not well understood, despite the fact that, as discussed herein, self-employment is a quantitatively significant aspect of the work experience of young men. It would be useful to better understand the underpinnings of this important aspect of policy making and labor market behavior.

The focus of our investigation is the empirical phenomenon that the offspring of the self-employed display a greater propensity to become entrepreneurs. Previous research suggests two possible explanations for this correlation. In the first hypothesis, capital market constraints limit the ability of entrepreneurs to finance start-up ventures and, thus, are a significant barrier to becoming an entrepreneur. In the absence of capital market imperfections, individuals are price takers in the credit market and the ability to obtain capital and start the enterprise will be independent of the entrepreneur's personal finances. However, Meyer (1990), Blanchflower and Oswald (forthcoming), Evans and Leighton (1989), Evans and Jovanovic (1989), and Holtz-Eakin, Joulfaian and Rosen (1994a, 1994b) all provide evidence that greater personal wealth relaxes capital market constraints and eases the transition to entrepreneurship. To the extent that this is the case, successful entrepreneurs may 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.

An alternative explanation is that self-employment is correlated across generations because parents transmit to their offspring valuable work experience, reputation, or other managerial human

capital. The correlation in self-employment echoes recent studies (Altonji and Dunn 1991, Solon 1992 and Zimmerman 1992) of intergenerational income correlation and intergenerational correlations in work hours, wages, and earnings (Altonji and Dunn 1991, 1994), but few studies have looked at the sources of these correlations. Among the few studies of self-employment, Lentz and Laband (1983, 1990) show that the probability that a young man is self-employed is significantly higher when his father is self-employed. Using French data Laferrère and McEntee (1996) also find that having a self-employed father or father-in-law about doubles the son's self-employment probability.

Thus, the previous literature points toward financial and human capital as alternative explanations of 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 man becoming self-employed. To anticipate the results, we find that parental self-employment 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 the son's general human capital. Moreover, the evidence indicates that the correlation is strongest in the presence of specific business success by the parents. This suggests that parents impart to their offspring entrepreneurial skills, as opposed to a taste for self-employment or general knowledge of the business world.

The remainder of the paper is organized as follows. In section 2 we develop the framework for our analysis, while in section 3 we describe the data used in our analysis and the observed patterns of self-employment. Section 4 analyzes the transition from wage and salary jobs to self-employment in a regression framework. Section 5 summarizes our findings and presents suggestions for future research.

2 Framework for Analysis

We build our framework with two objectives in mind. First, we wish to link our work directly with the existing literature on capital market constraints and transitions to self-employment. Second, we wish to focus on the financial and human capital relations *across* generations, at the expense of a detailed investigation of intertemporal accumulation decisions *within* each generation.

Thus, following Evans and Jovanovic (1989) and Holtz-Eakin, Joulfaian, and Rosen (1994a) we assume that utility depends on income (Y_i) and a vector (Z_i) of personal characteristics (*e.g.*, education, race, marital status, number of children). If earnings ability in a wage and salary job is w_i , assets are A_i , and the net rate of return is 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 ability as an entrepreneur and ε is an independent random element with a mean of one and finite variance. The contributions of parents to k_i and θ_i are the focus of our attention.

If restricted to his or her own resources, after investing k_i in the business the individual has $A_i - k_i$ available to earn capital income. Thus, 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. In the presence of capital market imperfections, the amount of borrowing, and thus capital invested in the enterprise, is bounded by a liquidity constraint generated by the financial markets. In keeping with the previous literature, we assume that the size of the constraint depends on the individual's net assets: $k_i \leq l_k(A_i)$, where $l_k'(A_i) > 0$. As noted at the outset, however, it is possible that individuals are not limited by their personal wealth alone and that the offspring of wealthy parents have better access to capital assets through the influence of their parents' wealth.¹ One way to capture this influence is to let the "effective" assets of an individual be given by

$A_i + \phi A_i^p$, where A^p denotes parental assets and ϕ is the rate of exchange between own and parental assets.

For an entrepreneur, the optimal amount of capital maximizes expected entrepreneurial income subject to the liquidity constraint. The solution to this problem implies that $k_i^* = g(A_i, A_i^p, \theta_i^e)$, where θ_i^e is the individual's expected ability as an entrepreneur. In the previous literature, the impact on k_i^* of changing A_i forms the basis of a test for the existence of liquidity constraints. If the entrepreneurial venture is liquidity constrained, $\frac{dk_i^*}{dA_i} = l_k'(\cdot) > 0$. Otherwise, $\frac{dk_i^*}{dA_i} = 0$. In our setting, we obtain the additional prediction that parental assets will also relax liquidity constraints; *i.e.*, $\frac{dk_i^*}{dA_i^p} = \phi l_k'(\cdot) > 0$.

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

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

Equation (1) indicates that the decision to become an entrepreneur depends not only on tastes (Z) and resources (A and A^p), but also on relative (expected) ability in each mode. In general, one would expect that the ability to succeed in self-employment, θ_i , has a distribution across individuals. Moreover, an individual may not know his or her ability until after becoming an entrepreneur. The possibility arises, however, that parents' experiences as self-employed entrepreneurs may affect the individual's expectations of, and actual, success if he chooses self-employment.

As noted by Lentz and Laband (1983, 1990) and others, the probability that an individual is self-employed increases if his parents were also self-employed. This propensity may derive from the transmission of "intangible family-specific capital" such as general managerial expertise,

reputation, or job-specific knowledge. Thus, θ may be higher among the offspring of the self-employed.

Of course, it is possible that intergenerational transmission of entrepreneurial skills is not the sole mechanism at work. It may be the case that the children of the self-employed reflect similarities among family members in attitudes or preferences for autonomy. Moreover, there may be other personal attributes—hard-working, disciplined, independent, *etc.*—that are passed on within families and are correlated with the probability of becoming self-employed. Thus, in the empirical work that follows, we seek to find evidence of the impact of human and financial capital, respectively, while controlling for other influences that derive from families.

3 Descriptive Analyses

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.² We further restrict our attention to observations for young men to only years after their last reported enrollment in school. We do this to avoid the “fits and starts” associated with labor market activity during schooling and between periods of interrupted schooling. We keep observations for the parents in the older cohorts until the parent reaches age 65 or first reports being retired.³

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 or her “class of worker” category for the current or most recent job is “own farm or business,” incorporated or otherwise.⁴ For parents, we have a class of worker report for whichever parent is a member of one 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.⁵

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 to 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 only those 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 self-employment rates for the parents. Not surprisingly, self-employment rates are higher and more stable among the fathers, rising from 22 percent to only 24

percent over the period. Equally unsurprising, these rates exceed those among mothers, which range from 5 percent to 9 percent.⁶ 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 their time in the survey. 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 parents in the sample.⁷

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 figures 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. 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 quantitatively less dramatic, difference prevails among the sons whose mothers had different labor force experiences.⁸

An immediate concern arises that the apparent intergenerational linkage in self-employment is merely an artifact of sons following in their parents' occupations. As Blau and Duncan (1967) and Lentz and Laband (1983) demonstrate, some occupations (*e.g.*, doctors, plumbers, farmers) are characterized by greater rates of self-employment than others. If occupational following is strong in these professions, then intergenerational correlations in self-employment may simply mirror the occupational following rate. The data, however, reveal that this is far from the case. Self-employed sons followed their fathers' occupations in 32 percent of cases compared to a rate of 22 percent for the never self-employed sons. Among "second generation" self-employed sons, the occupational following rate is higher at 41 percent.⁹ Viewed differently, this says that a majority of self-employed sons entered occupations other than those of their (self-employed or nonself-employed) fathers.

Another possibility is that the observed intergenerational self-employment linkages reflect family businesses. Admitting a son to the family business may be a way for parents to accommodate his preference for self-employment while avoiding the capital expenditures that would be necessary to establish him in an independent enterprise. Or, it may be a more efficient way for parents to transmit reputation capital or job-specific managerial expertise. The data do not allow us to directly identify self-employment resulting from entering an existing family business. A reasonable assumption, however, is that a son who inherits or enters a family business is observed with the same occupation and industry classifications as his father. Using this definition, only 36 percent of second generation self-employed sons would be classified as entering a family business. This compares to an industry-and-occupation following rate of 8 percent for sons who never became self-employed.¹⁰

Thus, the pattern of self-employment rates appears not to be solely an artifact of 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. A second lesson is that, 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 self-employment experience also raises the intensity of self-employment (as measured by the fraction of years the son spent self-employed conditional upon any self-employment) and lowers by 1.5 years the age at which self-employment begins.¹¹ 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.¹²

A final piece of suggestive evidence emerges from an examination of brothers in the NLS. If parents do exert a strong influence on children’s careers, then—absent strong tendencies toward primogeniture—one would expect to see effects on all children in the family. In fact, 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 observed working in the NLS, 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 in which neither parent was self-employed, one of the two sons was self-employed in at least one survey year only 12.0 percent of the time, and both sons were self-employed in only 3.5 percent of the time. In contrast, the corresponding computations for the families where parents had self-employment experience are 28.2 percent and 16.1 percent,

respectively. A higher prevalence of self-employment is evident 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 when 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 more able to influence their children's employment choices by providing start-up capital. Indeed, the self-employed parents in our sample are wealthier than their counterparts. Their mean (median) nonbusiness assets are \$49,000 (\$31,500), substantially larger than the corresponding values of \$33,700 (\$21,600) for the never-self-employed parents.¹⁴ 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 parental wealth with experience, it is useful to focus briefly on the raw correspondence between the pattern of son's self-employment and parental 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 sons.

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.¹⁵ 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 possibility again arises that self-employment among sons reflects 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.

4 Multivariate Analyses

Thus far, we have examined the influences of parental financial capital and self-employment in isolation. However, the discussion in Section 2 emphasizes as well the importance of the son's personal characteristics as well as the role of his own 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. Matching across cohorts provides us with a rich panel of data for sons and their parents. We employ a standard set of demographic variables for the son: 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 for his human capital using his age and education. Specifically, we use yearly enrollment and highest grade completed reports to construct a measure of educational attainment and then transform it into a set

of indicator variables for less than high school, high school graduate, some college, college graduate, and post college education. The son's assets are measured net of the household's business assets. Parents' assets and self-employment are measured as described in section 3. However, in later sections, we use various other constructions of these variables in sensitivity tests. Descriptive statistics for our data are shown in Table 5.

With these data at our disposal, we examine the degree to which the positive correlations with parents' self-employment and wealth survive a multivariate analysis. We employ a logit model to analyze transitions from wage and salary jobs to self-employment.¹⁶ A transition from a wage and salary job in year t to self-employment in year $t+1$ is coded as a 1, while remaining in a wage and salary job is coded as a 0. In principle, access to panel data permits an econometric structure that explicitly incorporates the time dimension. The results of Rhody (1998), however, suggest little payoff to a duration model in this setting. Hence, we restrict ourselves to the more straightforward logit analysis. In doing so, however, we correct our standard errors using Huber's formula to account for the fact that there are multiple observations per son. As noted at the outset, focusing on transitions into self-employment, 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, demographic variables and human capital, and then successively augment the equation with variables capturing the potential contributions of their parents' financial capital and self-employment experience.

4.1 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.¹⁷ 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 specification (and all others) 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 estimates for 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. 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 on capital market constraints on the entry into entrepreneurship.¹⁸

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 influence. Using total assets instead of non-business assets (column 3) gives a slightly stronger and more significant estimate. The larger coefficient on total assets confirms our expectation that parents' 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 impact of the son's own assets.¹⁹

One concern is that the evolution of parents' assets may be influenced by the son's entry to self-employment; *i.e.*, it may be the case that parents' assets are 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, when the sons are quite young or still in school, thus lessening the possibility that parental asset accumulation is driven by the son's business plans. Although the estimated coefficient is larger, the marginal effect of parents' assets remains small at 0.00011.

Another concern is that the coefficient on the parents' assets may be biased downward because of reporting error in the value of the assets, or because assets are subject to transitory shocks so that any one year's report may not be a good indicator of the parents' "permanent" wealth. Solon (1989) shows that the attenuation bias due to classical measurement error is mitigated when a time average of the suspect variable is used. We re-ran all the specifications in Table 6 replacing the parents' contemporaneous asset report with its time average. This transformation had virtually no effect on the parents' assets coefficient or on any of the other coefficients.

We turn next to investigating the role of the parents' non-financial business capital. These results are presented in the remaining columns of Table 6. We consolidate the self-employment experiences of the parents into a single variable, PARENT_SE, 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 large positive effect when entered by itself. Moreover, the statistical significance of this variable remains intact in a multivariate analysis even when it is entered along with the parents' net-of-business assets (column 6) or their total assets (column 7).

At the same time, including PARENT_SE 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 0.031.²⁰

In short, parents' assets—whether measured as contemporaneous, “initial,” or “permanent,” business or non-business—exert a positive, but quantitatively small influence on the son's entry to self-employment. On the other hand, parents' self-employment experience has a very large and significant effect, just about doubling the probability of the son's entering self-employment.

The final column of the table permits the fathers' and mothers' self-employment experiences to have separate influences on their sons. Why might we expect these effects to be different? One possibility is that sons 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 rate is 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 the stronger predictor of son's self-employment propensity.

To examine these conjectures we decompose the PARENT_SE variable into the variables FATHER_SE, MOTHER_SE, and BOTH_SE. 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 have a weak and insignificant influence on sons' self-employment. However, having two self-employed parents has the strongest effect. We ran a parallel analysis for the young women's cohort of the NLS and found that the mother's effect is strongest for daughters, although the father's effect and the “both” effect are also strong and significant. These

results are 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 these similarities may be traced to intergenerational correlations in work preferences, rather than to labor supply responses to similarities in wages. One interpretation of the evidence here is that entrepreneurial tastes or abilities are also transmitted more strongly from parents to children of the same gender.

4.2 Alternative Specifications

These results suggest a very important role for parents' self-employment 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. Next, we relaxed the linear specification of sons' assets by adopting a quadratic specification, also 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.

In section 4.1 we report the results of informal tests for potential biases on the parents' assets coefficient due to endogeneity and to measurement error. In addition, we allowed for more flexible parameterizations of the parental assets effects. However, including quadratic terms or permitting liabilities and assets to have different effects on the transition probabilities did not alter our conclusion that the impact of parental assets is small.

Finally, we investigated whether the duration or timing of the parents' self-employment experience matters. We measured the parents' self-employment variously as the fraction of the parents' working time spent in self-employment, whether the parents were self-employed in 1966 (when the sons were youngest), and whether they were self-employed in the year of the son's observation. All of these variables had effects of the same magnitude as our preferred "any parental exposure over the sample period" variable reported in Table 6.

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

4.3 Skills or Tastes?

One interpretation of these results is that the significance of parents' self-employment does not reflect the transmission of skills or other aspects of human capital, but rather the conveyance of tastes for autonomy or for a self-employed 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 simply observing self-employment *per se*, one would not expect variations in parental success to be important, once we have controlled for their exposure to self-employment.²¹

To discriminate between these alternatives, we measured parental "success" in three ways: as the fraction of the parents' observed working time in self-employment (PFRACT_SE), 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. More time in self-employment, greater flows of income from self-employment, or greater accumulation of business capital are all indicative of

successful parental self-employment. We augmented our transition equation with a variable computed as the interaction of our indicator for any parental self-employment (*PARENT_SE*) and the various measure of success. Table 7 displays these estimates.

Column 1 shows the results for the time spent in self-employment variable. This variable ranges from 0 when neither parent is ever self-employed to 1 when the working parent(s) is always self-employed.²² When entered alone (in column 1), this variable has a very strong, positive and highly significant impact. Furthermore, this effect is only slightly diminished when it is entered along with the indicator for any parental self-employment in column 2, while the effect of the formerly very powerful indicator variable, *PARENT_SE*, shrinks and loses its significance. The message is that parents' time in self-employment has an independent and stronger effect on the likelihood of the son's transition than the simple exposure to self-employment.

In both cases where business success is measured in dollar terms, the effects are also positive and statistically significant. In column 3, the effect of the parents' business assets is nearly 1.5 times as large as the effect of non-business assets. In the last column, parents' business income has an even larger effect. Thus, using either time in self-employment or business income or business 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. Furthermore, the evidence from section 3.2 that shows the majority of sons enter different industries and occupations from their fathers argues that the expertise being passed within families is not entirely job- or industry-specific.

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 that generates and sustains entrepreneurs. Our investigation of data from the NLS suggests important roles for intergenerational transfers of financial capital and, especially, intangible business capital captured by parents' self-employment. 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 family-specific capital *per se* and the transmission of these skills within families in enhancing the probability of making a transition to entrepreneurship.

Endnotes

1. Recent studies of intra-family resource sharing include these: Altonji, Hayashi, and Kotlikoff (1992) examine income 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.
2. There are two possible ways to match a father's information to the son's record. First, the father may appear in the older men's sample. Alternatively, the son's mother may be in the mature women sample. If so, we rely on her report of her husband's information. Similar rules apply to matching mothers and sons.
3. 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, thus, lower our measure of self-employment.
4. 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.
5. We employ the NLS-provided weights to provide population estimates.
6. Devine (1994) studies the recent growth in female self-employment rates.
7. 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

8. For each pair of columns, t-tests reject at conventional significance levels the hypothesis that the “any self-employment” rates are equal.
9. We use NLS-provided classifications of 12 different occupational categories and define following to have occurred if the son’s occupation in 1981 (when he is between 29 and 39 years old) matches his father’s 1966 occupation (when he is between 45 and 59 years old and the son is between 14 and 24 years old). Lentz and Laband find that self-employed sons are three times more likely to be occupational followers than the average worker. The prevalence of following is affected by the age at observation (observing sons at younger ages lowers the following rates) and by the number of occupational categories. For example, Lentz and Laband (1983) report a average rate of 2.3 percent using 3-digit occupation codes, while Blau and Duncan’s (1967) higher estimate is based on 17 occupational categories.
10. Our industry and occupation classifications are very broad: there are only 12 occupations and 12 industries. Using a different sample, Lentz and Laband (1990) found that 26.5 percent of second-generation proprietors reported having inherited or bought a family business.
11. 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.
12. We do not directly study the effects of parents on the duration of the son’s self-employment, since so few exits from self-employment are observed in our matched subsample of parents and sons. Evans and Leighton (1989) study entry and exit using the NLS, but since they do not account for the influences of parents on these processes, they are able to use the full young men’s sample. Fairlie (forthcoming) finds that exit rates are lower for second-generation self-employed sons in the Panel Study of Income Dynamics.
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 in which parents were and were not self-employed. We do not report results for families with four or more brothers due to small samples, but the pattern is the same as reported in Table 3.
14. All dollar values have been converted to 1982-84 dollars using the Consumer Price Index.
15. 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 in the multivariate exercise to follow, we interpolate an asset value for every survey year between each two consecutive asset reports. We do this for parents’ assets and for sons’ assets. See Dunn and Holtz-Eakin (1995) for additional details regarding the measurement of assets.

16. We ignore transitions from school directly into self-employment and from unemployment into self-employment. We do allow for re-entries into self-employment that occur after episodes of wage and salary work. In practice, the results we report in section 4 are unchanged when we include the transitions from school and from unemployment.
17. This is very close to Fairlie's (forthcoming) estimate of the transition probability of 3.3 percent for men in the PSID over the years 1968 to 1989.
18. Fairlie (forthcoming) 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. Similarly, Blanchflower and Oswald (forthcoming) find large effects of inheritances using British data. In contrast, Meyer (1990) finds tiny effects: additional \$100,000 of net worth raises the transition probability by only 0.00017.
19. One may worry that son's and parents' assets are highly correlated with each other or to some omitted variable. This turns out not to be the case. The effect of the son's own assets is very stable across all the specifications in Table 6, and the coefficient on parents' assets is unchanged when the son's assets are omitted from the specification (not shown in the table).
20. Fairlie (forthcoming) finds similar strong effects—father's self-employment raises the son's transition probability at the mean by 53 percent.
21. Similarly, Lentz and Laband (1983, 1989, 1992) argue that rates of occupational following (and implicitly, following into self-employment) should be determined in part intangible factors such as, the degree to which the parent's work can be observed by the child, by the cost of transferring job-specific skills, by the size of the reputation benefits that might be conferred, or the potential for nepotism.
22. The conditional mean of this variable is 0.44. It is quite evenly distributed over its range: of the parents who were ever self-employed, 39 percent spent a quarter or less of their time in self-employment, 64 percent spent half or less, 81 percent spent three-quarters or less, and only 10 percent of the parents were always self-employed.

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

Indicator	NLS		
	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 work 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]

^aAll 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. Mothers are aged 30 to 44 in 1967.

Table 2: Intergenerational Links in Self-Employment^a

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

^aSelf-employment rates are conditional upon working at all and are unweighted. Numbers in parentheses are standard deviations; those in brackets are sample sizes. Samples are defined as in Table 1.

Table 3. Prevalence of Self-Employment among Brothers^a

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
1	0	88.9	74.5
	1	11.1 [923]	25.5 [416]
2	0	84.6	55.6
	1	12.0	28.2
	2	3.5 [259]	16.1 [124]
3	0	78.0	43.8
	1	19.5	25.0
	2	2.4	18.8
	3	0.0 [41]	12.5 [16]

^aSample is restricted to sons who have completed schooling and worked at least one year. Self-employment is defined as “ever self-employed” during the survey. Sample sizes are in brackets.

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

	(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) [11]	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]

^aEntries 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^a
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)
ANY_SE (ever self-employed?)	0.16 (0.37)	0.00	1.00
PARENT_SE (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

^aSample 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 and reported having a job. Income and assets are measured in 1982-84 dollars.

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

	(1)	(2)	(3)	(4)*	(5)	(6)	(7)	(8)
ASSETS	0.0078	0.0073	0.0075	0.0093	0.0080	0.0076	0.0077	0.0073
(own non-business assets)	(0.002)	(0.006)	(0.006)	(0.005)	(0.001)	(0.002)	(0.002)	(0.002)
	[0.00015]	[0.00014]	[0.00014]	[0.00015]	[0.00015]	[0.00014]	[0.00014]	[0.00013]
PNASSETS		0.0037		0.0066		0.0029		0.0031
(parents' non-business assets)		(0.027)		(0.002)		(0.078)		(0.061)
		[0.00007]		[0.00011]		[0.00005]		[0.00006]
PTASSETS			0.0048				0.0039	
(parents' total assets)			(0.000)				(0.000)	
			[0.00009]				[0.00007]	
PARENT_SE					0.7027	0.6484	0.4727	
(either parent self-employed?)					(0.002)	(0.005)	(0.054)	
					[0.01539]	[0.01387]	[0.00959]	
FATHER_SE								0.6048
(only father self-employed)								(0.023)
								[0.01336]
MOTHER_SE								0.0482
(only mother self-employed)								(0.925)
								[0.00090]
BOTH_SE								1.1157
(both parents self-employed)								(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

^aEach equation also includes year-specific intercepts, age, age squared, four education dummies, number of siblings, 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. Assets are measured in thousands of dollars.

*In column (4) parents' assets are measured in 1966, the start of the sample period. The sample size is smaller because not all parents provided asset reports in 1966, but did so in later years.

Table 7: Parents' Business Success and the Transition to Self-Employment^a

	(1)	(2)	(3)	(4)
ASSETS (own nonbusiness assets)	0.0073 (0.002) [0.00009]	0.0074 (0.002) [0.00009]	0.0079 (0.001) [0.00014]	0.0075 (0.002) [0.00014]
PNASSETS (parents' nonbusiness assets)	0.0034 (0.040) [0.00004]	0.0033 (0.052) [0.00004]	0.0029 (0.080) [0.00005]	0.0028 (0.090) [0.00005]
PARENT_SE (parent ever self-employed)		0.1482 (0.663) [0.00189]	0.4494 (0.075) [0.00905]	0.5005 (0.052) [0.01030]
PFRACT_SE (percent of parents' working years spent self-employed)	1.3504 (0.000) [0.01677]	1.1676 (0.020) [0.01442]		
PARENT_SE*BUS_ASST (parents' business assets)			0.0046 (0.000) [0.00008]	
PARENT_SE*BUS_INC (parents' business income)				0.0280 (0.066) [0.00051]
N (observations)	3173	3173	3173	3173
Sample Probability	0.031	0.031	0.031	0.031

^aEach equation also includes year-specific intercepts, age, age squared, four education dummies, number of siblings, 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. Business assets and business income are constructed as panel means.

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

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, noncentral 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 nonbusiness 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

^aSpecification also includes 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. Assets and income are measured in thousands.

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