Liquidity Constraints and Entrepreneurship.
Household Wealth, Parental Wealth, and the Transition In and Out of Entrepreneurship[1]

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Introduction

Entrepreneurs have historically played an important role in economic growth.[2] Business ownership is central to a range of issues in both economic theory and public policy, and many countries have programs and institutions that aim to encourage it. For example, the United States established the Small Business Administration (SBA) in 1953 to monitor and promote business ownership. One of the focuses of the SBA has been entrepreneurs' access to capital. The SBA has provided nearly twenty million small businesses with direct or indirect help since 1953. During the 1990s alone, the SBA helped close to 435,000 small businesses receive more than $94.6 billion in loans.[3]

Many empirical papers by leading economists show that, despite the attempts of governmental agencies and the development of financial markets, liquidity constraints are still an important deterrent to business ownership. Several papers referenced in this work find that wealth is positively correlated with the propensity to start a business. That is, the wealthier the household, the more likely it is to start a business. These papers all conclude that liquidity constraints prevent would-be entrepreneurs from starting their businesses.[4]

We show that the evidence that liquidity constraints have prevented U.S. households from starting businesses during the last two decades. is, in fact, very weak. Using

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[2] As discussed later, there is no clear-cut definition of entrepreneurs. We here use *entrepreneurs* and *business owners* interchangeably.

[3] See SBA's overview and history at http://www.sba.gov/aboutsba/history.html

[4] See Gentry and Hubbard (2004) and the references therein.

additional empirical specifications, a much richer set of data, and exploration of the variations in economic conditions during the past two decades, we are able to examine the underlying reasons for the correlation between wealth and entrepreneurship in depth. Although, like other authors, we find a positive correlation between initial household wealth and the probability that a household will subsequently start a business, we also show this is no proof that liquidity constraints bind entrepreneurs in starting their businesses.

We use several data sources to perform our empirical analysis: the Panel Study of Income Dynamics (PSID), the Health and Retirement Study (HR*S*), the National Longitudinal Survey of Youth (NLSY), and the National Survey of Small Business Finances (NSSBF), which cover different groups of the population for the late 1980s and the 1990s. Using these sources, we first document some important facts about business owners. We then demonstrate that the relationship between wealth and business ownership does not necessarily imply the existence of binding liquidity constraints. The data sets give us a better understanding of who the entrepreneurs are and provide evidence that the correlation between wealth and business entry is, at least in part, due to differences between business owners and non-business-owners in abilities, preferences, and family backgrounds.

We show that, contrary to the predictions of a model of entrepreneurship with liquidity constraints, the relationship between wealth and business entry is highly nonlinear. Over most of the distribution of wealth, there is no discernible difference in the propensity to

become a business owner. It is only at the very top of the wealth distribution (top 5 percent) that a positive relationship between wealth and business entry can be found. According to the model we examine, moreover, liquidity constraints should be more stringent for firms requiring high initial capital. We divide businesses into industries with high- and low- starting-capital requirements and find no evidence that wealth matters more for businesses requiring higher initial capital.

A few researchers test for liquidity constraints differently: rather than using wealth, they use inheritances as a proxy for liquidity. They show that those who receive inheritances are subsequently more likely to start businesses, again arguing that liquidity constraints limit business ownership. This approach certainly represents a superior method of testing for liquidity constraints. However, inheritances are not randomly distributed in the population. In fact, they are more likely to be received by those at the top of the wealth distribution, thus capturing the nonlinear relationship between wealth and business entry we find in our work. Moreover, inheritances may simply proxy for talents and ability; those with talented parents are also more talented themselves and inherently display a higher propensity toward business ownership. Since talents are positively correlated with wealth, wealthier parents tend to have children who are more likely to start a business. To prove this claim, we show that not only past inheritances but also future inheritances (inheritances received *after* a business is started) are correlated with business entry. We also show that the recipients of inheritances already have large amounts of wealth, often much more than is needed to start a business.

We propose a new measure of liquidity: capital gains on housing. Housing prices have increased over time and across regions in the United States, often delivering large capital gains to home owners. The increase in wealth deriving from capital gains is spread throughout the wealth distribution and does not affect only those at the top of the wealth distribution. Moreover, households can easily access this increase in wealth by borrowing against home equity. When using this alternative measure of liquidity, we do not find any evidence that those households who benefit from an increase in their home equity are more likely than others to start a business.

Data

As mentioned above, we use several data sets to gain deeper insight into the characteristics of entrepreneurs. Although our empirical analysis is based mainly on one data set, the PSID, we rely on other data sets to provide information that cannot be captured by the PSID alone, and that allow us to study different age groups and the distinct characteristics that set entrepreneurs apart from the rest of the population.

We use data from the PSID for the late 1980s and the early 1990s to address the role of household wealth in propagating business ownership. The PSID is a large-scale panel survey that tracks socioeconomic variables of a given family over time. It reports detailed information about wealth at five-year intervals and collects information on parental wealth for both the head of the family and the spouse in 1988. Significantly for our work, in every year, the PSID asks its respondents to report whether they own a business.

This data set allows us to examine entrepreneurs in the entire population and, given its panel aspect, to examine the transition in and out of entrepreneurship.

We also use data from the 1992 HRS, a data set that reports information about the cohort born between 1931 and 1941, thus allowing us to examine older entrepreneurs. This data set provides information not only on wealth but also on a rich set of demographic and economic characteristics, including the respondent's expectations about the future and relationship with the family of origin. To study younger entrepreneurs, we use data from the NLSY-Cohort97. This data set reports information on a cohort of parents with teenage children (age twelve to sixteen) in 1997. Finally, we use data from the 1987 NSSBF, which provides a direct measure of the capital needed to start a business, a critical piece of information for our work.

Simple Facts about Entrepreneurship and Wealth

Who is an entrepreneur is one of the critical questions researchers face. Given our focus on wealth and business equity, we define entrepreneurs here as those households that report owning a business. This definition is similar to that used in several other studies.[5]

We report below some descriptive statistics that guide our evaluation of the effects of wealth on the transition in and out of entrepreneurship. Using data from the PSID in 1989, we find that entrepreneurs are much richer than other households and account for the lion's share of wealth in the economy. Entrepreneurs account for approximately 13 percent of the population, but they alone account for 41.8 percent of total household

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[5] See, for example, Gentry and Hubbard (2004), Quadrini (1999), and Cagetti and DeNardi (2004).

wealth.[6] Median wealth holdings of those households that own a business are more than

three times the amount of wealth held by those who do not own a business ($179,189

versus $47,116).[7] Differences are even bigger in mean wealth holdings ($486,909 versus

$119,313). Note that this is not simply due to the size of business equity; wealth is

substantially larger for entrepreneurs relative to the rest of the population even when

subtracting business equity.

Differences in wealth magnify for older entrepreneurs. Using HRS data. we find that

19.2 percent of households own a business in 1992 and that their median and mean

wealth holdings are three to four times bigger than those of the rest of the population,

even when subtracting business equity (median nonbusiness wealth is $85,000 for

nonentrepreneurs versus $204,000 for entrepreneurs, and means are $161,800 and

$419,500 respectively). This result is not simply due to the fact that older entrepreneurs

are more likely to be successful ones. Even young entrepreneurs are much richer than the

rest of the population. Data from the NLSY in 1997 indicate that 12.4 percent of parents

with teenage children (the population sampled in the NLSY) own a business, and that

their median wealth is more than three times that of their nonentrepreneur counterparts

(median nonbusiness wealth is $29,100 for nonentrepreneurs versus $98,000 for

entrepreneurs, and means are $74,600 and $205,800 respectively).

The positive correlation between wealth and entrepreneurship becomes obvious when the

data are examined more closely. Table 1 shows the percentage of entrepreneurs in the

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[6] Total household wealth is defined as the sum of savings and checking accounts, bonds, stocks, IRAs, housing equity, other real estate, business equity, and vehicles, minus all debt
[7] All dollar amounts in this paper (including the tables) are reported in 1996 dollars unless otherwise indicated.

overall household wealth distribution in the 1989 PSID, 1992 HRS, and 1997 NLSY samples. Results are consistent across the three samples. Entrepreneurs tend to be concentrated in the upper end of the total wealth distribution. In the PSID, entrepreneurs make up 27.7 percent of households in the 80th-90th percentile of the wealth distribution, 31.9 percent of households in the 90th-97th percentile of wealth distribution, and 62.1 percent of households in the top 3 percent of the distribution. Likewise, they make up 80.6 percent of households in the top 3 percent of the wealth distribution in the HRS and 80.7 percent of households in the top 3 percent of the wealth distribution in the NLSY. These results clearly show that there is a strong and positive relationship between household wealth and entrepreneurship.

A second feature to note in our household data sets is that many business owners report low amounts for their business equity. Table 2 shows that more than 30 percent of business owners in the 1989 PSID report having zero business equity, and results are similar in the other data sets. While the fraction of zero business equity decreases as we move up in the wealth distribution, approximately 10 percent of the business owners in the 80th-97th percentile in the wealth distribution report zero business equity (table 1). Further differences among business owners appear when we look closely at business equity in table 2 (each of these surveys ask their respondents how much their business would be worth if they sold off all their assets and paid off all their debts). While some entrepreneurs have more than $1 million in business equity, the majority of entrepreneurs have $20,000 or less in business equity. As expected, the distribution of business equity

is highly skewed to the right. Thus, empirical samples will contain entrepreneurs whose businesses vary greatly by size.

Note that that zero business equity does not necessarily characterize small entrepreneurs or entrepreneurs who remain small. Approximately 20 percent of entrepreneurs who report zero business equity in the PSID in 1989 end up having more than $94,000 of business equity in 1994. Some authors, such as Gentry and Hubbard (2004), exclude business owners with less than $5,000 of business equity from their sample. In practice, this corresponds to excluding a large number of business owners (38 percent of the business owners in the PSID sample).

Data from the HRS already show that the correlation between business ownership and wealth may have sources other than liquidity constraints. Table 3 reports the means of demographic variables for all non-business-owners, all business owners, and the top 25 percent of business owners in the nonbusiness wealth distribution (net worth minus business equity). It is obvious from the table that business owners are quite different from non-business-owners and, furthermore, that wealthy business owners are quite different from less wealthy business owners.[8] Not only are business owners more likely to be male, white, and married than non-business-owners, but they are also more likely to come from a more educated family (i.e., to have at least one parent with a high school diploma). Business owners also score higher on tests of cognitive ability (i.e., think more quickly and are better able to make analogies) and display stronger economic ties with

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[8] Differences between entrepreneurs and nonentrepreneurs found in the HRS data are similar to differences found in the PSID and NLSY samples. For brevity, we report only the HRS results. We focus on the HRS sample because of the richness of data on attitudes toward risk, motives to save, and intergenerational transfers.

family and relatives (i.e., are more likely both to receive money from and give money to family and relatives). Most important, compared to the rest of the population, they display different motives to save: They are less likely to be covered by a pension, and report a greater intention to bequeath an inheritance. These motives, per se, rationalize why they should hold more wealth than other households.

Even among business owners, differences are sharp. Wealthy business owners are more likely to have a college degree or postgraduate degree, and they score even higher on tests of cognitive ability than business owners in general. If educational status and cognitive abilities proxy for entrepreneurial talents, our data show a correlation between wealth and these talents. There are also differences in family background; wealthy entrepreneurs are more likely to come from a family with higher levels of education, to have received money or major assets from relatives as well as inheritances, and to give financial help to their family in the future. They are also more likely to wish to leave a sizeable inheritance to their heirs.

Simple Facts about the Capital Needed to Start a Business

Data from the 1987 NSSBF provide a direct measure of the capital needed to start a business. Between 1980 and 1988, the median wealth utilized by those starting a business was $34,600. Close to 25 percent of small businesses were started with less than $8,000, and 75 percent of them were started with less than $95,000. Thus, it appears that the median household that starts a business needs little initial capital.

Meyer (1990) examines a similar question from the 1982 Characteristics of Business Owners data and reports even smaller figures for the capital needed to start a business. He shows that 63 percent of nonminority male business owners and 78 percent of black business owners indicated that they needed less than $5,000 to start their business (approximately $8,700 in 1996 dollars). Similar results are reported by Bhidé (2000), which examines the initial capital used by successful start-ups. Bhidé analyzes a sample of firms from *Inc. Magazine,* which tracks the five hundred fastest growing U.S. companies. He reports that 26 percent of the firms in his subsample started with less than $5,000 in up-front capital. Of all five hundred companies listed in *Inc.,* more than a third started their businesses with less than $10,000, and two thirds with less than $50,000 (Bhidé, 2000).

Note that, if liquidity constraints exist, they should be more likely to bind for those households that require a higher amount of capital to start a business. In a later section, we use NSSBF business equity information to segment the firms into two groups for analysis, firms that require low starting capital and firms that requires high starting capital. We look first, however, at whether the fact that wealth is positively correlated with starting a business implies that liquidity constraints affect the decision to start a business.

Assessing the Importance of Liquidity Constraints

We use data from the whole population to assess whether liquidity constraints prevent would-be entrepreneurs from starting a business. We use a variety of tests to assess the importance of liquidity constraints.

Wealth and the Transition into Entrepreneurship

To examine the relationship between household wealth and the transition into business ownership, we use data from the PSID for the time period 1984 to 1994. Of course, empirically testing the effects of liquidity constraints on entrepreneurship requires us to define both terms. We view liquidity constraints as the inability of households to borrow to finance their entrepreneurial projects. If starting capital is nontrivial, the inability to borrow constrains low-wealth households from starting a business, implying that the likelihood of small business formation should increase with wealth. Most important, if liquidity constraints are driving the positive correlation between household wealth and starting a business, then this relationship should vanish at high levels of wealth as the constraint ceases to bind. While we define entrepreneurs as those owing a business (irrespective of business wealth), as a robust check we also include in our definition of entrepreneurs those who are self-employed.[9]

To examine the role of initial wealth in the decision to start a business, we created a pooled sample of non-business-owners from the 1989 and 1994 waves of the PSID. A

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[9] The main results of this paper are unaffected by whether we classify entrepreneurs as business owners or as self-employed.

household is defined as entering entrepreneurship if either the head of household or the spouse becomes a business owner in the subsequent one-year period. To eliminate households in which the head is still in school or is close to retirement, we restrict our sample to nonretired household heads between the ages of twenty-two and sixty. Our total sample has 7,645 observations.

As do other studies, we find that the effect of wealth on business entry is positive and statistically significant. However, the effect is economically small (Hurst and Lusardi 2004, table 2, column I).[10] Increasing household wealth by $100,000 increases the probability of starting a business by less than one-half of one percentage point. With the base probability of becoming an entrepreneur in the subsequent year 4.5 percent, an increase in wealth of $100,000 increases the probability of business ownership only by 10 percent, from roughly 4.5 percent to 5 percent. Relative to both the mean and the median values of wealth for this sample, $100,000 represents a very large change in wealth (Hurst and Lusardi 2004, table 1). It should be noted that our estimated magnitudes are similar to results reported by other authors who use different data sets, different sample periods, or different definitions of entrepreneurship (Evans and Jovanovic 1989, Evans and Leighton 1989, Holtz-Eakin, Joulfaian, and Rosen, 1994b, Fairlie 1999, Quadrini 1999, and Gentry and Hubbard 2004).

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[10] Household net worth excludes business equity. In addition to wealth, the controls included in the regression include a quadratic in age; a series of education, race, and family structure dummies; a quadratic in household labor income, dummies for whether the household head is currently unemployed or was unemployed any time in the prior five years,;and a dummy for whether the household was a business owner any time in the prior five years.

Furthermore, contrary to the theoretical predictions discussed above, we do not find the incremental impact of another dollar of wealth on the probability of starting a business to be a decreasing function of wealth. In fact, the predicted probability of starting a business estimated from the nonlinear model does not vary with wealth over most of the wealth distribution. We can demonstrate this point by rerunning our empirical specification discussed above, but replacing the level of net worth with a fifth-order polynomial (Hurst and Lusardi 2004, table 2, column II). These results are shown graphically in Figure 1.[11] The estimated probability of starting a business for someone with $20,000 in wealth is nearly identical to the estimated probability of starting a business for someone with $200,000 in wealth (the estimates are 0.029 and 0.031 with standard errors of 0.003 and 0.005, respectively). It is only at the very top of the wealth distribution – above the 95th percentile (approximately $300,000 of wealth) – that the probability of starting a business becomes large. Given that the median amount of business capital needed to start a business is less than $23,000, our empirical findings cast doubts on whether liquidity constraints are driving the positive correlation between wealth and business start-ups. The positive association between wealth and business entry found in the linear model is simply driven by households at the top of the wealth distribution.

Parental Wealth and the Transition into Entrepreneurship

If liquidity constraints are important, there may be other means of acquiring the capital needed to start a business besides drawing on private savings. For example, households

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[11] This figure is the same as figure 1 in Hurst and Lusardi (2004). To create the figure, we fitted the regression using the mean levels of all the other control variables aside from net worth.

who come from wealthier families may be able to receive loans or financial support from their parents. In our analysis of how parental wealth affects entrepreneurship, we restrict our analysis to younger households because, for most of the older households, there is no information on parental wealth in the PSID. Our results indicate that parental wealth is a significant predictor of whether the child becomes an entrepreneur between 1989 and 1994.[12] As reported in table 4, when parental wealth increases by $100,000, the probability that the child becomes a business owner increases by 0.005 percent (an increase of 5.7 percent over the base probability of entering).

Upon further examination, it appears that the significance of parental wealth is not driven by the existence of binding liquidity constraints. We break down the parental wealth distribution into wealth quartiles and find a strong nonlinear relationship between wealth and business start-ups (see table 4, column II). The only parental wealth category that significantly predicts the probability that a child will become a business owner is the one for parents who have wealth in the top 3 percent of the parental wealth distribution. Having such rich parents increases the probability that the child will become a business owner by 7.2 percentage points over someone who has a parent with wealth in the bottom quintile of the parental wealth distribution. None of the other parental wealth categories significantly predicts child business ownership (up to the 97th percentile of the wealth distribution). Moreover, the coefficients are essentially flat between the 40th and 97th percentiles of the parental wealth distribution. Thus the lack of impact of parental wealth (more precisely, modest to large amounts of wealth) on the decision to start a business

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[12] This is true after controlling for parental self-employment status, which is a very significant predictor of whether the children become entrepreneurs.

suggests that liquidity constraints are not an important deterrent to business ownership. However, one of the most striking results shown on table 4 is the relationship between parents who are entrepreneurs and children who are entrepreneurs. This table makes clear that having a parent who is an entrepreneur affects a child's entrepreneurial probability much more than having rich parents (i.e., parents whose wealth is between $100,000 and $200,000).

Wealth, the Transition into Entrepreneurship, and Business Type

Our findings thus far show that over most of the wealth distribution the probability of starting a business is flat, and that wealth appears to matter only for those households at the top of the wealth distribution. One possible explanation for this pattern is that little wealth is required to enter most entrepreneurial activities, but high capital requirements may render some activities accessible only to the very wealthy. In the presence of liquidity constraints, wealth should matter more for starting a business that requires a large initial capital investment than for starting one that requires a small initial capital investment. Using data from the NSSBF, we segment industries in the PSID by the amount of capital needed to start a business. On average, starting a business in the construction or service industries requires less than $20,000 in initial capital. Firms in all other industries require starting capital that ranges from double to triple the amount (Hurst and Lusardi 2004, table A1). In the 1993 PSID data, 52.8 percent of businesses reported being in a low-starting-capital industry (service or construction). The number is

close to the fraction of firms in the construction and service industries reported in the 1987 NSSBF (41.2 percent).

If liquidity constraints are a deterrent to business formation, we would expect a stronger positive relationship between wealth and business entry for those in a high-starting-capital industry than for those in a low-starting-capital industry. Our results show this is not the case (Hurst and Lusardi 2004, figure 2). The probability of starting a business in a high-starting-capital industry as a function of wealth is strikingly similar to the probability of starting a business in a low-starting–capital industry. The probability of starting a business in either a high- or a low-starting-capital industry does not increase until wealth reaches the top 5 percent of the distribution (above $280,000 in household wealth). Additionally, the marginal effect of wealth on the probability of starting a business in a high-starting-capital industry is nearly identical to that of starting a business in a low-starting-capital industry. A $10,000 increase in wealth decreases the probability of starting a business in a high starting capital industry, on average by 0.04 percentage points, whereas the comparable marginal effect for starting a business in the low-starting-capital industry is –0.06 percentage points. Moreover, there is no statistical difference between someone with $15,000 in wealth and someone with $150,000 in wealth. Thus, we do not find any effect of wealth on the probability of business ownership, even when looking at industry where the constraints should bind the most.

Wealth and the Transition into Entrepreneurship in Sub-samples of Households More Likely to be Liquidity Constrained

In this subsection, we look at the effect of initial wealth as well as change in wealth on the decision to become an entrepreneur for those groups of non-business-owners who are more likely to be liquidity constrained, such as young, black, and female entrepreneurs (Fairlie forthcoming). All of these groups have substantially lower earnings than their more advantaged counterparts. Women earn about two-thirds of what men earn (U.S. Bureau of the Census 2004), while blacks, unconditionally, earn about two-thirds to three-quarters of what whites earn (U.S. Bureau of the Census 2003) and have substantially lower levels of assets than whites (Fairlie 1999). Theory predicts that there should be a greater positive relationship between wealth and the transition into entrepreneurship when liquidity constraints are more likely to bind. To test this prediction, we look at wealth changes in addition to wealth levels.

When we consider the transition into entrepreneurship for young households in the PSID (younger than forty in 1989), we find that net wealth is not statistically significant (table 5). This result is not sensitive to the age cutoff imposed on the data since the result remains insignificant when we restrict our samples to households less than thirty-five years of age or thirty years of age. Wealth and the change in wealth are also not statistically significant for black entrepreneurs or for female entrepreneurs (table 5). These findings are consistent with the results presented in other papers. Meyer (1990), for example, using several data sets and focusing on black entrepreneurs, does not find any

evidence that financial resources play a role in explaining the transition into entrepreneurship. This is an interesting result given that minority business owners are thought to be more likely to be liquidity constrained. Similarly, Dunn and Holtz-Eakin (1995) find only weak evidence that wealth affects entrepreneurship among the young (both male and female young entrepreneurs). Coleman (2004) also finds limited evidence of liquidity constraints for female entrepreneurs.

Inheritance and the Propensity to Start a Business

One problem with these types of tests, as mentioned before, is that wealth may proxy for something else (for example, talents). Several authors have recognized this problem and propose alternative measures of liquidity. Both Blanchflower and Oswald (1998) and Holtz-Eakin, Joulfaian, and Rosen (1994a) used inheritances in place of wealth. They show that those households that receive inheritances are more likely to start a business and succeed in entrepreneurship. These findings have been generally interpreted -- both by economists and by the SBA -- as supporting the relevance of liquidity constraints to entrepreneurship.

But there are several ways to interpret the correlation between wealth and the transition in and out of entrepreneurship. First, tax reasons cause many small and mid-size businesses to be transferred at the time of death; many families simply pass on their business to their heirs. Thus, the correlation between the receipt of inheritances and entrepreneurship may capture simply the correlation in intergenerational wealth and occupations, and not the existence of liquidity constraints (Charles and Hurst 2003).

Second, the receipt of an inheritance is not necessarily a random event. Households that receive inheritances are much more likely to come from wealthy families. Thus, the correlation may capture simply the nonlinear relationship between wealth and business entry we discussed before. Moreover, given the strong intergenerational correlation in education and saving preferences, households receiving inheritances may simply display different entrepreneurial propensities than households that do not receive inheritances.

We can provide several pieces of evidence supporting these claims. First, people who receive inheritances generally already have enough money to start the business (Holtz-Eakin, Joulfaian, and Rosen 1994a). Second, and more important, if inheritances represent just liquidity, inheritances received in the past should predict current business entry, whereas future inheritances should not. Using data from the PSID, we find that, as in the previous work, inheritances do indeed correlate with starting a business. However, not only past inheritances matter; future inheritances (inheritances received after starting a business) are also correlated with the probability of starting a business today (Hurst and Lusardi 2004, table 3). This shows that the timing of inheritances is not crucial for new business formation, and .thus that the receipt of inheritances is proxying for something other than changes in household liquidity. In the next section, we propose an alternative measure of liquidity.

Housing Capital Gains and the Transition into Entrepreneurship

During the mid-1980s, U.S. housing prices increased considerably, often delivering large capital gains to many households. To capture changes in wealth experienced by most households, not simply those at the top of the wealth distribution, we explore regional changes in housing prices as a better and more exogenous measure of liquidity.

Two considerations with respect to the housing capital gain variable are noteworthy. First, if potential entrepreneurs intend to use home equity to surmount liquidity constraints, it is not important whether households perceive these changes in housing prices to be transitory or permanent. As long as lenders are willing to lend to households on the basis of their housing equity, households can borrow against their increased housing equity to relax any liquidity constraints they face. This notion is supported by empirical evidence that lenders are willing to lend (and households are willing to borrow) when households experience large capital gains on housing (Hurst and Stafford 2004). Second, regional movement in business conditions could change both housing prices and the desire of households in a given region to become business owners. If this latent unobserved variable results in a positive correlation between housing prices and the propensity to start a business, our approach will be biased towards finding an effect of wealth on business creation.

We find that the correlation between housing capital gains and business start-ups is not statistically different from zero (Hurst and Lusardi 2004, table 3). Thus, when we consider a more exogenous variable than wealth or inheritances to measure liquidity

constraints, our estimates offer little support in favor of liquidity constraints. Those households who become wealthier because of capital gains on their homes are no more likely to start a business than those who enjoy lower or zero wealth increases.

VI. Liquidity Constraints and Business Survival

Having explored the effect of liquidity constraints on the formation of businesses, we now ask whether liquidity constraints affect the survival of businesses. If entrepreneurs cannot borrow to attain their profit-maximizing levels of capital, they may start under-capitalized businesses that are less likely to be profitable. Thus, entrepreneurs who have substantial personal financial resources may be more likely to survive. As reported below, our results show otherwise.

We again explore the panel aspect of the PSID. As we did after our previous tests, we find that neither the one-year survival nor the five-year survival is significantly correlated with personal wealth. (see table 6). We then investigate the relationship between business survival and parental wealth and find a significant positive correlation. However, parental wealth is significant for the one-year survival only for those at the top 20 percent of the parental wealth distribution. For the five-year survival, parental wealth is significant for those in the middle of the parental wealth distribution and those above the median value of parental wealth. These results are broadly consistent with the work of Holtz-Eakin, Joulfaian, and Rosen (1994a). While they find that the coefficient of household wealth is significant statistically, it is essentially zero. According to their

finding, a $100,000 inheritance increases the probability of survival by only 0.009 percentage points, where the base survival rate for their sample was 0.730.

Our findings show first, that personal wealth does not correlate with business survival, and second, that although parental wealth correlates with business survival positively, it is mainly driven by the wealthy.

Conclusion

Several studies have documented the positive relationship between wealth and the likelihood of starting a business. This association has been read as evidence that liquidity constraints are a deterrent to new business formation. But this conclusion is premature. Throughout most of the wealth distribution (up through $200,000 in household wealth), there is no discernible relationship between household wealth and the probability of starting a business. Only for households at the very top of the wealth distribution is there a strong and positive relationship between wealth and business entry.

Data on capital requirements for start-ups in different industries and among different groups, on the timing of inheritances, and on the experience of households that enjoyed capital gains on their homes provide further evidence that high levels of liquidity are not essential for starting a small business. They also show that the survival of businesses is not affected by the wealth of the entrepreneurs.

Our results do not imply that any given household wanting to start a small business has unlimited access to credit at reasonable borrowing rates. Given optimal lender behavior and common sense, such results would be implausible. We do conclude, however, that even if some households that want to start small businesses are currently constrained in their borrowing, such constraints are not empirically important in deterring the majority of small business formation in the United States. This finding may simply reflect the fact that the starting capital required for most businesses is sufficiently small. We provide evidence to this effect throughout the chapter. Alternatively, even if the required starting capital for some small businesses is high, existing institutions and lending markets in the United States appear to work sufficiently well at funneling funds to households with worthy entrepreneurial projects.

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Table 1. Percentage of Entrepreneurs and Entrepreneurs with Zero Business Equity in the PSID, HRS, and NLSY Wealth Distributions

PANEL A: 1989 Panel Study of Income Dynamics (PSID)

Wealth Distribution (upper cutoff in parentheses)	Percentage of Entrepreneurs in the Wealth Distribution	Percentage of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution
Quintile 1 ($2,800)	4.0 (19.7)	35.6 (48.2)
Quintile 2 (25,400)	5.9 (23.6)	44.6 (49.9)
Quintile 3 (75,500)	10.5 (30.6)	19.8 (39.9)
Quintile 4 (199,000)	12.4 (32.9)	20.3 (40.3)
80th - 90th percentile (359,200)	27.7 (44.8)	12.1 (32.6)
90th - 97th percentile (793,800)	31.9 (46.4)	12.2 (32.9)
Above 97th percentile	62.1 (48.6)	6.2 (24.2)

Notes: Data from the 1989 full sample of PSID respondents. Data weighted using PSID core sample weights. Standard deviations are in parentheses. All dollar values reported in 1996 dollars.

PANEL B: 1992 Health and Retirement Study (HRS)

Wealth Distribution (upper cutoff in parentheses)	Percentage of Entrepreneurs in the Wealth Distribution	Percentage of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution
Quintile 1 ($20,132)	4.4 (20.6)	54.4 (50.2)
Quintile 2 (74,900)	7.7 (26.7)	37.0 (48.5)
Quintile 3 (151,100)	14.3 (35.0)	28.4 (45.3)
Quintile 4 (309,100)	22.6 (41.8)	19.9 (40.0)
80th - 90th percentile (541,900)	32.8 (47.0)	11.6 (32.1)
90th - 97th percentile (1,433,800)	53.0 (50.0)	9.0 (28.7)
Above 97th percentile	80.6 (39.6)	3.9 (19.3)

Notes: Data from the 1992 full sample of HRS households. Data weighted using HRS sample weights. Standard deviations are in parentheses. All dollar values reported in 1996 dollars.

Wealth Distribution (upper cutoff in parentheses)	*Percentage of Entrepreneurs in the Wealth Distribution*	*Percentage of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution*
Quintile 1 ($1,500)	2.9 (16.7)	46.2 (50.8)
Quintile 2 (20,500)	3.8 (19.2)	46.0 (50.6)
Quintile 3 (58,700)	8.7 (28.2)	33.0 (47.3)
Quintile 4 (147,700)	10.9 (31.3)	25.0 (43.5)
80th - 90th percentile (279,700)	22.7 (42.0)	14.8 (35.7)
90th - 97th percentile (716,900)	34.4 (47.6)	10.5 (30.8)
Above 97th percentile	80.7 (39.6)	4.3 (20.4)

Notes: Data from the 1997 full sample of NLSY parents. Data weighted using NLSY97 sample weights. Standard deviations are in parentheses. All dollar values reported in 1996 dollars.

Table 2. Distribution of Business Equity for Business Owners in the PSID, HRS, and NLSY

PANEL A: 1989 Panel Study of Income Dynamics

Percentile of Business Wealth For Business Owners	*Business Wealth Value*
20th Percentile	$0
40th Percentile	6,300
50th Percentile	18,900
60th Percentile	44,000
80th Percentile	125,800
90th Percentile	352,300
97th Percentile	1,258,100
Mean	$219,000
Percentage With Zero Business Equity	30.1
Percentage With Less than $5000 in Business Equity	38.0
Number of Households	1,100
Percentage of Total Sample that are Business Owners	13.1

Notes: Data from the 1989 PSID. Sample restricted to include all *PSID* respondents who reported owning a business in 1989. Data weighted using PSID core sample weights. All values are in 1996 dollars.

PANEL B: 1992 Health and Retirement Study

Percentile of Business Wealth For Business Owners	*Business Wealth Value*
20th Percentile	$560
40th Percentile	22,370
50th Percentile	53,680
60th Percentile	83,880
80th Percentile	251,640
90th Percentile	559,200
97th Percentile	1,677,600
Mean	249,200
Percentage With Zero Business Equity	18.6
Percentage With Less than $5000 in Business Equity	25.3
Number of Households	1,038
Percentage of Total Sample that are Business Owners	19.22

PANEL C: 1997 National Longitudinal Survey of Youth

Percentile of Business Wealth For Business Owners	*Business Wealth Value*
20th Percentile	$0
40th Percentile	10,760
50th Percentile	34,230
60th Percentile	90,760
80th Percentile	422,500
90th Percentile	880,200
97th Percentile	1,799,520
Mean	505,210
Percentage With Zero Business Equity	19.65
Percentage With Less than $5000 in Business Equity	30.23
Number of Households	546
Percentage of Total Sample that are Business Owners	12.4

Notes: Data from the 1997 NLSY. Sample includes all NLSY respondents who reported owning a business in 1997. Data weighted using NLSY sample weights. All values are in 1996 dollars.

Table 3. Means of Descriptive Variables for Nonentrepreneurs, Entrepreneurs, and Wealthy Entrepreneurs in the 1992 HRS Sample

Variables	(I) Non-Business Owners (4,790 obs)	(II) All-Business Owners (1,038 obs)	(III) Wealthy [a] Business Owners (237 obs)	t-stat: Diff (I) (II)	t-stat: Diff (II) -(III)
Age of Respondent	54.9	54.6	55.5	2.71	-4.09
Percentage Male	47.2	59.6	66.6	-7.43	-2.42
Percentage Hispanic	8.8	3.5	0.9	6.28	2.86
Percentage Black	11.8	4.1	1.8	10.21	2.32
Percentage with High School Diploma	37.5	31.7	23.1	2.43	3.00
Percentage with Some College Education	18.9	28.2	28.0	-7.13	0.32
Percentage with College Education	11.1	14.2	19.1	-3.71	-2.93
Percentage with More than a College Education	8.6	14.1	22.8	-5.74	-4.79
Percentage Married	62.4	82.5	85.6	-13.04	-1.71
Percentage in Excellent Health	23.4	34.7	44.1	-8.30	-3.03
Percentage Who Are the Most Risk Averse	61.6	60.2	61.1	0.47	-0.53
Percentage Who Are the Least Risk Averse	11.9	13.3	14.4	-0.43	-0.63
Score on Ability to Think Quickly (5 is highest score)	3.7	4.0	4.1	-9.95	-2.18
Score on Memory Test (# of words one can recall)	13.0	14.2	14.4	-7.91	-1.28
Score on Analogy Test (# of correct answers)	6.30	7.00	7.2	-8.25	-1.93
Percentage who Experienced Unemployment in the Past	34.3	22.2	10.8	7.91	4.92
Percentage who Experienced Negative Financial Shocks in Past	32.6	35.7	24.9	-1.85	3.78
Percentage w/ at Least One Parent w/ a High School Diploma	44.7	59.7	66.7	-10.15	-2.95
Probability of Giving Financial Help to Family in Next 10 Years	39.1	43.9	49.2	-4.11	-2.54
Percentage Who Received an Insurance Settlement	5.5	4.5	3.5	0.94	0.017
Percentage Who Received Money or Major Assets from Relatives	7.1	12.3	19.3	-6.22	-4.13
Percentage Who Received Inheritances	18.4	26.8	32.3	-7.47	-2.55
Percentage Who Expect to Leave a Sizeable Inheritance to Heirs	39.3	55.0	80.1	-9.61	-9.40
Percentage who have a Pension	54.3	31.1	31.2	12.12	0.061
Total Family Income	46,920	78,083	138,128	-18.17	-14.54
Business Equity	0	249,204	590,740	-25.90	-9.58

Notes: Data is from the 1992 sample of HRS households. Data weighted using HRS sample weights. All values are reported in 1996 dollars. Because of missing values, the means of some variables are reported for smaller sample sizes than the one reported in this table. "Wealthy business owners" refers to business owners who are in the top quartile of business owners' nonbusiness wealth distribution.

Table 4. Who Becomes an Entrepreneur? The Effect of Parental Wealth and Occupation in Younger Households. Linear Probability Regressions

Variables	I	II
Include a full set of income and demographic controls?	Yes	Yes
Household's Own Nonbusiness Net Worth in 1989 (in $100,000)	0.008 (0.007)	0.009 (0.007)
Dummy: Husband's/Wife's Father is a Business Owner	**0.048 (0.023)**	**0.049 (0.023)**
Total Net Worth of Both Husband's and Wife's Parents (in $100,000)	**0.005 (0.003)**	
Dummy: Parental Wealth 20th - 40th percentile		0.024 (0.020)
Dummy: Parental Wealth 40th - 60th percentile		0.002 (0.018)
Dummy: Parental Wealth 60th - 80th percentile		0.021 (0.019)
Dummy: Parental Wealth 80th - 90th percentile		0.032 (0.021)
Dummy: Parental Wealth 90th - 97th percentile		0.025 (0.024)
Dummy: Parental Wealth > 97th percentile		**0.072 (0.039)**

Notes: This table reports linear probability estimates of the transition into business ownership in the subsequent year. Regressions include controls for demographics (age, education, family composition), current and past income, employment status, past business ownership, and whether the husband's and wife's parents are alive. Sample includes all PSID non-business-owners in 1989 between the ages of twenty-two and forty-five who were not retired. The top 1 percent of both household and parental wealth distribution was truncated. The number of observations is 2,829. Standard errors are in parentheses. Coefficients in bold are significant at the 10 percent level.

Table 5. Who Becomes an Entrepreneur? The Effect of Household Wealth.
Linear Probability Regressions on Alternate Samples

OLS Regressions/Samples:	Coefficient on Household Wealth	Coefficient on Changes in Household Wealth
	I	**II**
Dependent Variable: Households that Become Business Owners By 1994		
a. Young Sample	1.12 E-7	-2.19 E-7
	(1.11 E-7)	(2.71 E-7)
b. Black Sample	4.83 E-8	-2.39 E-7
	(1.78 E-7)	(1.97 E-7)
c. Female Sample	-1.04 E-7	1.69 E-7
	(8.31 E-8)	(2.04 E-7)

Notes: This table reports the results of a regression of the probability that a household enters entrepreneurship between 1989 and 1994 on household wealth in 1989 and many other demographic and income controls for young, black, and female-headed households. In column II, it reports the results of a similar regression, but using changes in wealth rather than wealth levels. Regressions include controls for demographics (age, education, family composition), current and past income, employment status, and past business ownership. The sample used to perform the regression in column I is restricted to all nonretired households in the PSID between the age of twenty-two and forty who did not own a business in 1989. The sample used to perform the regression in column II is restricted to all nonretired households in the PSID between the age of twenty-two and forty who did not own a business in 1989, who were in the sample in 1984, and who did not own a business during that year. Young households are defined as households whose head is between the age of twenty-two and forty in 1989 (2,452 observations for regression I and 2,083 observations for regression II). Black households are those where the head of the household is black (1,351 observations for regression I and 1,261 observations for regression II). Female households refer to households where the head is female (821 observations for regression I and 757 observations for regression II). Standard errors are in parentheses. Coefficients in bold are significant at the 10 percent level.
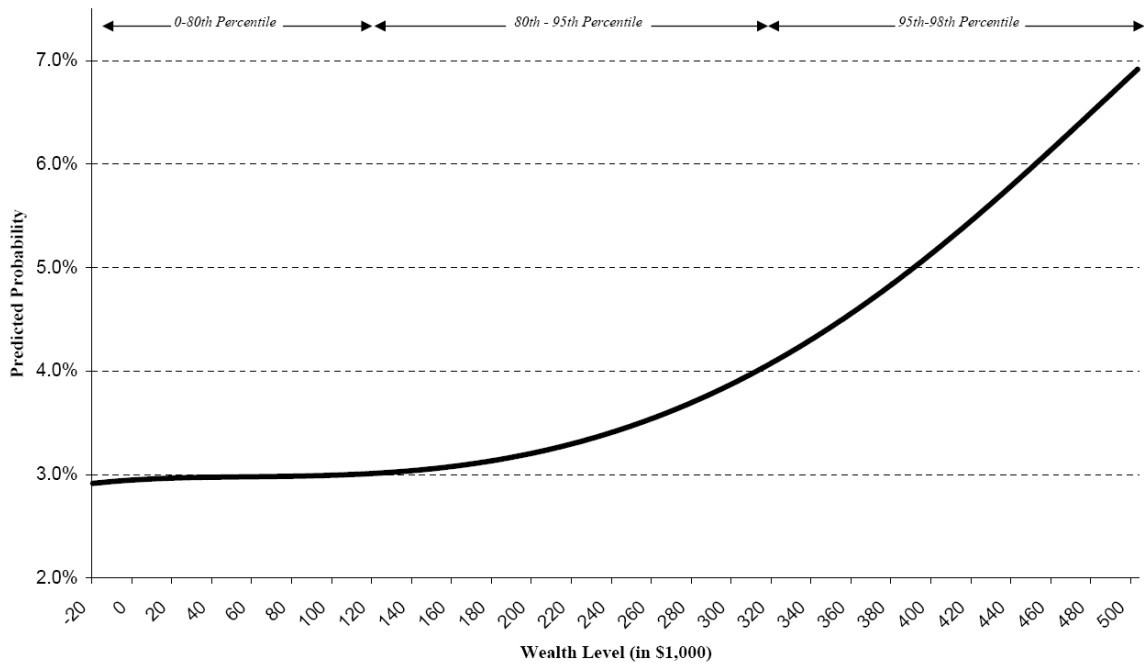
Table 6. Who Survives as Entrepreneur? The Effect of Personal and Parental Net Worth.
Linear Regressions of One-Year and Five-Year Business Survival Probabilities

Variables	One-Year Survival Regressions		Five-Year Survival Regressions	
	I	II	III	IV
Include Demographic and Income Controls?	Yes	Yes	Yes	Yes
Household's Own Nonbusiness Net Worth in 1989	1.50 E-7 (2.08 E-7)		1.20 E-7 (1.45 E-7)	
Dummy: Household Wealth 20th - 40th percentile		-0.028 (0.058)		0.029 (0.040)
Dummy: Household Wealth 40th - 60th percentile		0.079 (0.061)		0.088 (0.045)
Dummy: Household Wealth 60th - 80th percentile		0.104 (0.069)		0.020 (0.049)
Dummy: Household Wealth 80th - 90th percentile		0.101 (0.086)		**0.158 (0.073)**
Dummy: Household Wealth 90th - 97th percentile		0.136 (0.105)		0.075 (0.081)
Dummy: Household Wealth > 97th percentile		-0.093 (0.156)		0.080 (0.101)
Dummy: Husband's/Wife's Father is a Business Owner	-0.026 (0.073)	-0.026 (0.073)	0.029 (0.063)	0.027 (0.063)
Total Net Worth of Both Husband's and Wife's Parents	**2.91 E-7 (7.76 E-8)**		**1.42 E-7 (6.10 E-8)**	
Dummy: Parental Wealth 20th - 40th percentile		-0.138 (0.063)		-0.024 (0.039)
Dummy: Parental Wealth 40th - 60th percentile		0.049 (0.068)		0.013 (0.042)
Dummy: Parental Wealth 60th - 80th percentile		0.010 (0.068)		**0.082 (0.048)**
Dummy: Parental Wealth 80th - 90th percentile		**0.110 (0.067)**		**0.149 (0.056)**
Dummy: Parental Wealth 90th - 97th percentile		**0.170 (0.085)**		0.087 (0.071)
Dummy: Parental Wealth > 97th percentile		**0.282 (0.167)**		0.112 (0.116)
Mean of Dependent of Variable	0.458	0.458	0.167	0.167

Notes: This table reports the results of a regression of the probability of one-year survival (whether new business owners remained in business one year later) and five-year survival (whether new business owners remained in business five years later) on household wealth, parental wealth, and other controls. The controls include age, age squared, marital status, race, educational attainment, average income for the three years prior to becoming a business owner, income squared, time dummies for the year the household became a business owner, and a dummy for whether the household's parents are alive. All demographic controls were dated as of the year the household became a business

owner. The sample is restricted to all PSID households who became a business owner between 1984 and 1989, were not business owners two years before starting the business and remained in the sample for at least five years after starting the business. Personal and parental wealth are truncated at the top 1 percent. The number of observations is 931. Standard errors are in parentheses. Coefficients in bold are significant at the 10 percent level.

Figure 1: The Predicted Probability of Entrepreneurship as a Function of Wealth,
Linear Wealth Model (Solid Line), Non-Linear Wealth Model (Dotted Line), and Wealth Dummy Model (Dashed Line)

Notes: Sample includes all PSID non-business-owning households in the pooled 1989/1994 sample. This figure displays the predicted probability of starting a business using a nonlinear wealth model using a 5th order polynomial in wealth.