

Liquidity Constraints, Wealth Accumulation and Entrepreneurship

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Abstract

There exist many government programs in the U.S. aimed to foster entrepreneurship and, in particular, to relax credit restrictions new entrepreneurs may face. However, many leading empirical works have found that there exists a positive correlation between wealth and starting a business and argued that binding liquidity constraints prevent many households from becoming business owners. In this paper, we examine closely the relationship between wealth accumulation and entrepreneurship. We argue that, if liquidity constraints are binding, the incremental effect of a dollar of wealth on the probability to start a business should decrease as wealth increases. Using data from several surveys, we can reject the hypothesis that liquidity constraints are the cause of the observed wealth-business start-up correlation. We find that only a small group of extremely wealthy households (top 3% of the wealth distribution) drives the correlation between wealth and becoming a business owner. Additionally, we find that there is no correlation between initial wealth (and wealth changes) and the propensity to become a business owner among businesses that require high starting capital and among groups that are ex-ante more likely to be liquidity constrained, such as young, black, or female households. Furthermore, when using a more appropriate measure of liquidity and accessibility of funds, such as receiving insurance settlements or capital gains on home equity, we find that the positive correlation between wealth and starting a business vanishes. Finally, we examine the importance of family wealth in affecting the child's propensity to start a business as well as business survival. We again show that it is mainly those families at the very top of the wealth distribution that are responsible for driving the positive relationship between wealth and business start-up and wealth and business survival. Taken together, our evidence casts severe doubts that the mechanism at play in explaining the positive relationship between wealth and business start-up has much to do with the existence of liquidity constraints.

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“America’s small business owners and potential entrepreneurs often have the ideas, the energy, and the willingness to work hard, but face an almost insurmountable challenge in finding the capital they need when it can make a difference - in the early stages. Financing can be especially costly or more difficult for small firms to find.”

- Office of the Advocacy for the Small Business Administration in the *1997 Annual Report to the President of the United States on Small Business and Competition*.

1. Introduction

Entrepreneurs have traditionally played an important role in economic growth and technological innovation within the U.S. economy. Throughout the 1990s, the role of small businesses in economic growth appears to have remained strong. Between 1990 and 1995, small businesses created three quarters of the net new jobs in the U.S. During this same time period, employment by these establishments grew by 10.5%, compared with the 3.7% growth in the remaining, larger establishments.¹ Given the potential benefits of entrepreneurship to the economy, the U.S. established the *Small Business Administration (SBA)* in 1953 to monitor and promote business ownership. One of the areas of focus of the *SBA*, as noted by the above quote, is whether binding liquidity constraints prevent some entrepreneurs with worthy projects from receiving the funds necessary to start a business. In an attempt to alleviate these constraints, the *SBA* has made over twenty million loans and loan guarantees to entrepreneurs since 1953.² In 1997 alone, the *SBA* issued over \$9.5 billion in loans to small businesses through its loan guarantee program.

The evidence in many leading empirical papers is that, despite the attempts of governmental agencies and financial innovation in general, liquidity constraints are still an important deterrent to business ownership.³ Several papers, using many different data sets and sample designs and focusing on different time periods - including the late 1980s and the early 1990s, find that initial

¹ Figures come from *The State of Small Business: A Report to the President (1997)* published by the U.S. Small Business Administration.

² See Small Business Administration (1997).

³ See, for example, Evans and Jovanovic (1989), Evans and Leighton (1989), Holtz-Eakin, Joulfaian, and Rosen (1994), Blanchflower and Oswald (1998), Fairlie (1999), Quadrini (1999), and Gentry and Hubbard (2001).

wealth is positively correlated with the propensity to start a business. These authors have interpreted this finding as evidence that liquidity constraints are still an important impediment to entrepreneurship in the U.S.

In this paper, we look closely at the correlation between wealth and the propensity to become a business owner. We show that the evidence that liquidity constraints prevent households from entering entrepreneurship in the U.S. during the last two decades is, in fact, very weak. Like many other authors, we do find a positive correlation between initial household wealth and the probability that a household will subsequently own a business. However, this is not a proof that liquidity constraints bind. Using additional empirical specifications corresponding to theoretical predictions of models of entrepreneurial choice under liquidity constraints, using a much richer set of information, and exploiting the variation in economic conditions during the two past decades, we are better able to identify the reasons for the correlation between wealth and entrepreneurship than previous works.

In the first part of the paper, we use data from three different sources, the Panel Study of Income Dynamics (*PSID*), the Health and Retirement Study (*HRS*), and the National Longitudinal Survey of Youth (*NLSY*), which cover different groups of the population for the late 1980s and the 1990s, to show that the fact that wealth is correlated with business ownership does not necessarily imply the existence of binding liquidity constraints. We provide evidence that the correlation between wealth and business ownership is, at least in part, due to differences between business owners and non-business owners in abilities, preferences, and family background.

We then exploit the panel feature of the *PSID* and provide evidence that the documented correlation between wealth and business start-up is also not due to the existence of binding liquidity constraints. The *incremental* impact of wealth on the household's probability of starting a business should be a decreasing function of wealth (as liquidity constraints cease to bind). We find that the effect of wealth on the probability of entrepreneurship is small and statistically indistinguishable from zero over a majority of the wealth distribution. Most importantly, we show that it is only a

small group of very wealthy households (top 3% of the wealth distribution) that drives the correlation between wealth and business start-up. In other words, there is no statistical difference in the propensity to become a business owner, all else equal, between someone with \$20,000 of wealth and someone with \$200,000 of wealth. This is a novel and important result and one that casts severe doubts on the hypothesis that liquidity constraints are an important deterrent to entrepreneurship.

When we examine businesses with different starting capital requirements, we do find that the simple correlation between wealth and business start-up is stronger for businesses in industries that require larger initial capital outlays. But, as in the full sample, it is mainly the households at the top of the wealth distribution that drive this correlation. Additionally, we test for whether *changes* in wealth predict becoming an entrepreneur as well as examine the role of wealth in business start-up for groups of households that are *ex-ante* more likely to be liquidity constrained, such as young, black, and female households. We find no evidence in favor of liquidity constraints. When considering more exogenous changes in household liquidity (such as receiving insurance settlements or capital gains on home equity), we further show that there is no evidence of binding liquidity constraints in any of our samples and sub-samples and for businesses that require larger initial capital.

We also examine the importance of parental wealth and parental occupation in affecting the child's propensity to start a business. Finally, we consider the effects of family and own wealth on the probability that the business survives. Consistent with our main result, we again show that it is those families at the very top of the wealth distribution (top 3%) that are responsible for the positive relationship between family wealth and business start-ups. Similarly, the correlation between family wealth and business survival is mainly driven by those with high levels of family wealth. Throughout the paper, we also show that we can reconcile our results with many of the findings documented in the existing literature.

Taken together, our evidence is inconsistent with the existence of binding liquidity constraints as an explanation for the positive correlation between wealth and entrepreneurship in the U.S. since

1980. While there is a positive correlation in the data, it is driven by those at the top of the wealth distribution. The really wealthy are just ‘different’ from households in the rest of the wealth distribution – perhaps in their risk preferences or in their financial ability. This result casts doubts on the effectiveness of current public policies aimed at fostering entrepreneurship.

Our paper is organized as follows: In section 2, we provide the theoretical underpinnings of our empirical work and review the previous literature. In section 3, we describe our data sets and describe some simple facts about entrepreneurs. In Section 4, we examine the transition into entrepreneurship and study the role of wealth in the whole sample and across business type. In Section 5, we examine the effects of changes in wealth on starting a business, as well as study the relationship between wealth and the transition into entrepreneurship for young and minorities (female and black entrepreneurs). In this section, we also instrument for household wealth using variables that can better proxy for liquidity and accessibility of funds. In Section 6, we examine the role of family wealth and parental occupation on the decision to become an entrepreneur, while in Section 7, we examine the determinants of entrepreneurial survival. In the last section, we provide some brief conclusions and the policy implications of our work.

2. Theoretical Motivation and Empirical Specifications

If capital markets were complete, those with certain and positive net present value ‘entrepreneurial’ projects would easily be able to secure investment funds. However, the combination of tremendous risk, asymmetric information, and moral hazard makes it very difficult for households with worthy investment projects to generate the capital needed to start a business. Such capital market imperfections can cause lenders to constrain the credit they make available to would-be entrepreneurs.

Evans and Jovanovic (1989) developed a simple model that looks at the household decision to become a business owner in a world with exogenous liquidity constraints. The model assumes that individuals are endowed with entrepreneurial abilities and an initial amount of wealth, and that

lenders restrict the amount of borrowing households can get to a multiple of their initial wealth. A more able entrepreneur has a higher total product and a higher marginal product of capital at all levels of capital. He/she would, thus, gain a higher return from investing his/her capital in a business as opposed to investing in other financial assets. However, in the presence of constraints, some households with high ability will be prevented from becoming entrepreneurs because they are not able to start a business which is large enough to generate a total product which exceeds the household's non-entrepreneurial outside option. Other authors, such as Gentry and Hubbard (2001), have modified the model and assumed that imperfections in the financial market create a wedge in the borrowing and lending rates, rather than posit that individual can only borrow a certain percentage of initial assets, but the main predictions are basically the same. While individuals with high abilities and high wealth will select into entrepreneurship, those individuals with high abilities but whose endowment is too low may be prevented from doing so. In this set up, the existence of binding liquidity constraints implies a positive correlation between initial endowments of wealth and the propensity to start a business, conditional on entrepreneurial ability.

In order for these liquidity constraints to have a large effect on the number of entrepreneurs, the necessary capital for starting a business must be large (i.e., the constraint has to bind). Empirically, is the necessary starting capital for most businesses quantitatively large? Do liquidity constraints bind and prevent households with worthy projects from receiving the funds they need to start their business? Testing these propositions can prove difficult.

Early research focused on a simple theoretical prediction of the Evans and Jovanovic model described above: If liquidity constraints bind, the probability of becoming an entrepreneur should be an increasing function of wealth. Almost all of the authors who tested this proposition (Evans and Leighton (1989), Evans and Jovanovic (1989), Gentry and Hubbard (2001), Quadrini (1999), Fairlie (1999)) found a positive relationship between the propensity to start a business and household wealth (conditional on several other controls) and concluded that liquidity constraints were a deterrent to business start-up.

It should be noted, however, that these empirical findings are not universal. For example, Meyer (1990) uses several data sets and focuses on black entrepreneurs. He 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).

Inherent in the above test is the assumption that wealth and the propensity to become a business owner are correlated only when liquidity constraints bind. This, however, is rather restrictive. First, if households have declining absolute risk aversion preferences, and given that business ownership is a risky venture, higher wealth households will be more likely to become entrepreneurs even in a world with perfect capital markets. Additionally, a third factor - such as the household's financial sophistication - could be driving the correlation in wealth and business ownership. Households with more financial ability could be more likely to accumulate wealth and, at the same time, may be more likely to have the skills necessary to run a business.

There are other reasons why would-be entrepreneurs save more than the rest of the population. Kennickell and Lusardi (2001) show that business owners have a much stronger precautionary saving motive than non-entrepreneurs. According to their estimates, a large part of precautionary saving in the economy is accounted for by the entrepreneurs. Furthermore, as suggested by Gustman and Steinmeier (1999), many entrepreneurs do not have private pension. Thus, the non-pension wealth they own should also serve to support them in their old age. Finally, business ownership may simply be a luxury, consumption good,⁴ as well as a tax shelter. In these cases, it is mainly the rich who would want to own a business.⁵

With the above criticism in mind, other authors have looked at better proxies for liquidity constraints than simply wealth. Holtz-Eakin, Joulfaian and Rosen (1994) and Blanchflower and

⁴ There is anecdotal evidence, for example, of entertainment and sport celebrities opening restaurants as well as Wall Street brokers buying low-return vineyards or farms.

Oswald (1996) have used data on inheritances to show that those who received intergenerational transfers are more likely to be an entrepreneur and succeed in entrepreneurship. Does a household's propensity to start a business react to receiving an exogenous wealth shock? As noted by Holtz-Eakin, Joulfaian and Rosen (1994, page 55), "...the receipt of an inheritance is about as close to a 'natural' experiment' as one is likely to get in this area, which reduces potential endogeneity problems."

While this approach provides a clever and more convincing way to assess the importance of liquidity constraints, it still suffers from shortcomings. First and foremost, tax reasons cause many small and mid-size businesses to be transferred at the time of death. As a result of these tax issues and other factors, such as accidental death or the desire for households to remain a part of the business until their death, many families may simply pass on their business to their heirs at the time of death. Estimates from the 1993 National Survey of Small Business Finances (*NSSBF*) indicate that over 6.5% of business owners inherited their business. Thus, the correlation between the receipt of inheritances and entrepreneurship may simply capture the correlation in intergenerational wealth and occupations (Charles and Hurst (2001)) and not the existence of liquidity constraints.⁶

There is also a vast literature on the importance of liquidity constraints in affecting entrepreneurship in developing countries and in other foreign countries (see, Paulson and Townsend (2000), Guiso, Sapienza and Zingales (2001) and the references therein). These papers are broadly relevant for this topic, but are not directly related to this paper. Our work hinges on the state and development of financial markets in the U.S. and, additionally, on the policies to foster entrepreneurship implemented in the U.S. Thus, our findings are specific to the U.S. experience during the 1980s and the 1990s and should not necessarily be used to interpret the experience of other countries.

⁵ See, also, the discussion in Carroll (2000).

⁶ It should be noted that Holtz-Eakin, Joulfaian, and Rosen (1994) attempt to control for whether the business was transferred intergenerationally in their empirical work.

In this paper, we provide four new pieces of evidence as to whether liquidity constraints are an important deterrent to household business start-up. First, we examine a prediction of the Evans and Jovanovic model that has yet to be tested in the literature. According to this model, the *incremental* impact of household wealth on the probability of starting a business should be a decreasing function of wealth. If household ability is normally distributed, giving an additional dollar of wealth to households with low or moderate wealth levels should be more likely to relax a binding liquidity constraint than giving a dollar to households with high wealth levels.⁷ It should be noted that this test is applicable to a wide variety of liquidity constraint specifications. For example, if there is a fixed cost to entering entrepreneurship, the probability of entrepreneurship for households with wealth above the fixed cost should be unaffected by the receipt of an additional dollar of wealth. Thus, the likelihood of being liquidity constrained for a household with high wealth should be small.

Second, if liquidity constraints are important, wealth should be more important for households starting a business that requires a large amount of starting capital. Similarly, wealth should be more important for groups that are ex-ante more likely to be liquidity constrained. We test these predictions directly. Third, we use instruments for liquidity windfalls which are arguably more orthogonal to the business start-up decision than inheritances. Finally, we examine the role of family background (parental occupation and parental wealth) on the propensity of becoming an entrepreneur. All of these tests lead to the same conclusion: there is little or no evidence that liquidity constraints hinder entrepreneurship.

3. Data

In our work, we use data from the *PSID* from the late 1980s and the early 1990s to address the role of household wealth in propagating business ownership. Additionally, we use data from the

⁷ A formal proof of this prediction is available from the authors upon request.

1992 *HRS* and the *NLSY-Cohort97*.^{8,9} The *PSID* is a large scale panel survey which started in 1968 and tracks socio and economic variables of a given family over time. Information about income and demographics are reported at a yearly frequency. In addition, starting from 1984, the *PSID* reports detailed information about wealth at five-year intervals. It also collected information on parental wealth of both the head and the spouse in 1988. Importantly for our work, in every year, the *PSID* asks its respondents to report whether they own a business. This survey allows us to examine entrepreneurs in the whole population and, in particular given its panel aspect, to examine the transition in and out of entrepreneurship.

The *HRS* started in 1992 and reports a richness of information about the cohort born between 1931 and 1941. Not only does it report demographic, income, and wealth information, but it also reports information about past experiences, expectations about the future and the relationship with the family of origin. This data set allows us to examine the behavior of older entrepreneurs and to account for a large set of controls usually not available in other surveys. The *NLSY-Cohort97* reports demographic, income and wealth information on a cohort of parents with teenage children (age 12 to 16) in 1997. Thus, this survey allows us to study young entrepreneurs as well as look at more recent data than used in previous works. As will be explained below, the use of several sources of data makes it possible to examine different groups of the population, to provide careful tests of our hypotheses, and to explore several directions of analysis to sharpen our understanding of the relationship between entrepreneurship and wealth.

⁸ We also use data from the 1987 National Survey of Small Business Finances (*NSSBF*). The *NSSBF* is a survey of small business firms conducted in 1988-89 for the Board of Governors of the Federal Reserve System and the *SBA*. The survey provides information on the use of financial services and institutions for a nationally representative sample of firms (main sample) and a sample of firms with *SBA*-guaranteed loans (*SBA* sample). The target population for the main sample is all nonfinancial, nonfarm, small (fewer than 500 employees) business firms in operation as of December 1987. The sample was selected from Dun's Market Identifiers File. The target population for the *SBA* sample is all nonfinancial, nonfarm, small (fewer than 500 employees) business firms that received *SBA*-guaranteed loans in 1986 and were in operation as of December 1987.

⁹ For a detailed analysis of the *PSID* wealth data, see Hurst, Luoh and Stafford (1998), for the *HRS* wealth data, see Smith (1995), and for the wealth data in the *NLSY-Cohort 1997*, see Lusardi, Cossa and Krupka (2001).

3.1 Some Simple Facts about Entrepreneurship and Wealth

An issue we face in the empirical work is the definition of who is an “entrepreneur.” Unfortunately, theory provides little guidance to tackle this issue. Given our focus on wealth and business equity, we concentrate on households who self report owning businesses (one or more) and define entrepreneurs essentially as business owners (we use these terms interchangeably). This is similar to what has been done in several other studies.¹⁰ Specifically, in the *PSID*, households are asked “Did you (or anyone else in the family) own a business at any time in (year X) or have a financial interest in any business enterprise?” After that, respondents are asked what type of business it was (industry), who in the family owned it, whether the owner worked in the business, whether the business was incorporated, and the value of the business if all assets were sold and debts were paid off.

One of many reasons why entrepreneurs are of interest is that they hold an overwhelming amount of wealth in the U.S. This issue is especially relevant when attempting to test for whether the inability to borrow is an impediment to business ownership. Does one need wealth to become an entrepreneur (wealth causes entrepreneurship)? Do entrepreneurs earn a higher rate of return on their investment making them ex-post wealthier (entrepreneurship causes wealth)? Or, is there some third factor - such as financial ability or preferences - that drives both wealth accumulation and entrepreneurial success? We begin by documenting the wealth/entrepreneurship correlation and we then attempt to disentangle whether liquidity constraints are the cause of this correlation.

Using data from the *PSID* in 1989, we find that entrepreneurs account for approximately 13% of the population, but they alone account for 41.8% of total household wealth. Median wealth holdings of those 1989 *PSID* households who owned a business is more than three times the

¹⁰ Hubbard and Gentry (2001), and Cagetti and De Nardi (2001) use business ownership to define entrepreneurs. Evans and Leighton (1989), Evans and Jovanovic (1989), Blanchflower and Oswald (1998), and Fairlie (1999) use self-employment. Meyer (1990), and Quadrini (1999) use both business ownership and self-employment status, while Holtz-Eakin, Joulfaian and Rosen (1994) use schedule C in federal income tax returns to define entrepreneurs.

amount of wealth held by those who did not own a business (\$179,189 versus \$47,116).¹¹ Differences become even bigger when looking at mean wealth holdings (\$486,909 versus \$119,313). Note that this is not simply due to the size of business equity; wealth remain substantially bigger for the entrepreneurs than for the rest of the population even when subtracting business equity (the distribution of wealth and business equity is reported in Tables 1 and 2 and we will return to them in later sections).

Differences in wealth magnify when looking at older entrepreneurs in the *HRS*. We find that 19.2% of households own a business in 1992 and their median and mean wealth holdings are three to four bigger than the rest of the population and even when subtracting business equity (median non-business wealth is \$85,000 for non-entrepreneurs 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% of parents with teen-age children (the population sampled in the *NLSY*) own a business and their median wealth is more than three times that of their non-entrepreneur counterparts (median non-business wealth is \$29,100 for non-entrepreneurs versus \$98,000 for entrepreneurs and means are \$74,600 and \$205,800 respectively).

The positive correlation between wealth and entrepreneurship becomes obvious when examining the data more closely. Table 1 shows the percentage of entrepreneurs in the 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*, 27.7% of households in the 80th-90th percentile of the wealth distribution, 31.9% of households in the 90th-97th wealth distribution, and 62.1% of households in the top 3% of the distribution are entrepreneurs. Likewise, 80.6% of households in the top 3% of the wealth distribution in the *HRS* and 80.7% of households in the top 3% of the wealth distribution

¹¹ All dollar amounts in this paper (including the tables) are reported in 1996 dollars unless otherwise indicated.

in the *NLSY* are entrepreneurs. These results clearly show that there is a strong and positive relationship between household wealth and entrepreneurship.

There is much suggestive evidence in the *HRS* that the business ownership/wealth correlation derives from reasons other than liquidity constraints. Table 3 shows the means of demographic variables for all non-business owners, all business owners, and top 25% of business owners in the non-business 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.¹² Not only are business owners more likely to be male, white, and married than non-business owners, but they are also more likely to have high education and come from a higher education family (at least one parent has a high school diploma). Business owners also display higher cognitive abilities (abilities to think quickly and to make analogies). Most importantly, they display different motives to save than the rest of the population, as they are less likely to be covered by pension and report a stronger bequest motive than non-business owners. This, per se, rationalizes why they should hold more wealth. Business owners also display stronger economic ties with family and relatives (they are more likely not only to receive but also to give money to family and relatives).

Even among business owners, differences are sharp. Wealthy business owners are more likely to have a college degree or post-graduate degree, and they display even higher cognitive abilities than business owners in general. If educational status and cognitive abilities proxy for entrepreneurial talents, our data support the existence of a correlation between wealth and these talents. The family background is also different; wealthy entrepreneurs are more likely to come from family of higher education, to have received money or major assets from relatives as well as inheritances, and are more likely 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.

Further differences appear when looking 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—a crude measure for what is needed to buy a business). While some entrepreneurs have more than 1 million dollars 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 and empirical samples will contain entrepreneurs of very different size.

Column I of appendix Table A1 shows the breakdown of business occupations for those households who own businesses in 1989 in the *PSID*. Of these 484 households, over 60% are in four main occupational classes: managers, skilled laborers/craftsmen (auto mechanics, plumbers, etc.), technology (engineers and math, physics and life sciences), and farming. This table further illustrates the large amount of heterogeneity within business owners.

3.2 Some Simple Facts about the Capital Needed to Start a Business

If liquidity constraints are important to explain the wealth/entrepreneurship correlation, it is useful to pay attention to the amount of wealth needed to start a business. Data from the 1987 *NSSBF* provides a direct measure of the capital needed to start a business. In the *NSSBF*, respondents are asked to report: “How much owner's capital was used to start/purchase the business? Owner's capital is the amount of personal capital the owner used to start/purchase the business, including savings and money borrowed against personal assets.” This measure refers to the actual wealth new entrepreneurs used to start or purchase their business. Between 1980 and 1988, the median wealth used by those starting a business was \$34,600.¹³ Close to 25% of small businesses were started with less than \$8,000 and 75% of them were started with less than \$95,000. Figures are smaller if we exclude those who inherited or purchased their business: close to 25%

¹² Differences between entrepreneurs and non-entrepreneurs found in the *HRS* data are similar to differences found in the *PSID* and *NLSY* samples. For brevity, we only report the *HRS* results. We focus on the *HRS* sample because of the richness of questions on household ability, attitudes toward risk, motives to save, and intergenerational transfers.

¹³ Our sample includes businesses founded by current owner, businesses that are purchased, inherited or received as gifts, and publicly traded businesses from 1980 to 1988 for a total of 1,099 observations. To see the value of starting capital across industries, see Appendix Table A4.

started with less than \$5,000 and the median starting capital for founders is \$22,700. These results are only suggestive and we will explore the variation in starting capital across businesses in different industries in our empirical work below. But, at least on the surface, 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 funds needed to start a business. He shows that 63% of non-minority males and 78% of black business owners indicated they needed less than \$5,000 to start their business (approximately \$8,700 in 1996 dollars). Similar results are reported by Bhidé' (2000), which examined the starting capital of successful start-ups. Bhidé' analyzed a sample of firms from *Inc. Magazine* - which tracks the 500 fastest growing U.S. companies. Most of these firms started with little capital. To this point, he reports that 26% of the firms in his sub-sample started with less than \$5,000 in up front capital. He also reports the results of a survey of all companies in the *Inc.-500* sample. More than a third of the respondents started their businesses with less than \$10,000, with two thirds of the respondents starting with less than \$50,000 (Bhidé' (2000)).

A second thing to note in examining the value of business equity in our household data sets is that many business owners report low amounts for their business equity. Table 1 shows that more than 30% of business owners in the 1989 *PSID* report having zero business equity, and results are similar in the other data sets. These results are consistent throughout the wealth distribution (Table 1). In all data sets, approximately 10% of the business owners in the 80th - 97th percentile in the wealth distribution have zero business equity. More importantly, zero values of business equity do not necessarily characterize small entrepreneurs or entrepreneurs that remain small. Approximately

20% of entrepreneurs who report zero values of business equity in the *PSID* in 1989 end up having more than \$94,000 of business equity in 1994.¹⁴

As mentioned before, the median amount of business equity in all three surveys is also small; it is \$18,900 in the 1989 *PSID*, \$53,680 in the 1992 *HRS* sample, and \$34,230 in the 1997 *NLSY* sample (Table 2). It should be noted that these numbers are for established firms. How much business equity do new business owners have? As far as liquidity constraints are concerned, it is the capital needed at inception that could be a deterrent to starting a business. For simple illustrative statistics, we consider data in the *PSID* for new businesses (households that did not own a business in 1989, but did own a business in 1994). As expected, the data show that ‘new’ business owners have less business equity than existing entrepreneurs; 61% of these new business owners in 1994 had less than \$5,000 of business equity and over 3/4 had business equity less than \$25,000; and 45% had zero business equity in 1994. Only 8% of new business owners in 1994 had business equity greater than \$100,000. The numbers are historically very similar when looking at earlier periods in the *PSID*. Taken together, all of these findings suggest that if liquidity constraint exist, they should be most likely to bind for those households who have relatively low levels of wealth.¹⁵

4. Who Becomes an Entrepreneur? The Role of Wealth

As discussed in Section 2, a common test for liquidity constraints is whether wealth influences the transition into entrepreneurship.¹⁶ In this section, we exploit the panel feature of the *PSID* and

¹⁴ This fact is also important to understand the selection of the sample. Some authors, such as Gentry and Hubbard (2001), exclude business owners with low amounts of business equity. In practice, this corresponds to excluding a large number (close to 50% of the entire sample in the *PSID*) of business owners.

¹⁵ As additional cursory analysis of the importance of liquidity constraints as an impediment to business ownership, we have looked at the saving motives from the Survey of Consumer Finances (*SCF*). In that survey, respondents are asked to report (answers are open-ended) their “most important reasons for saving.” Data from the *SCF* in 1995, which is in the middle of the time period covered by our data sets, show that only a very small fraction of the population, 0.27%, have indicated they save for “buying (investing) in own business/farm or for buying equipment for business farm.” Even when adding respondents who have indicated they save “for investment reasons (to get interest, to be diversified, to buy other forms of assets),” the total fraction reporting these motives accounts for only 0.89% of the population. Looking at sub-groups of the population (young households, those who are not business owners) does not change the main result.

¹⁶ Some authors, such as Meyer (1990) and Dunn and Holtz-Eakin (1995), consider the relationship between being an entrepreneur and wealth. As mentioned earlier, this correlation may simply capture the fact that entrepreneurs have higher

examine the relationship between initial wealth and the propensity to become an entrepreneur. Specifically, we construct a sample of non-entrepreneurs in 1989 and follow their entrepreneurial status through 1994. We consider data from 1989 to 1994, as in both years we have information about household wealth. There were 3,425 non-entrepreneurs between the ages of 22 and 65 in 1989. Table A1 in the appendix reports the occupation of business owners in 1993 who did not own a business in 1989, and Table A2 in the appendix reports a description of income, wealth and demographic variables broken down by households who did and did not become business owners as of 1994.

4.1 Wealth and the Transition into Entrepreneurship

In column I of Table 4, we report the estimates from a linear probability regression of who transitions into entrepreneurship between 1989 and 1994 for the above sample of non-business owners in the 1989 *PSID*. Our left-hand side variable is a dummy variable equal to 1 if the household reports not being an entrepreneur in 1989 and reports being an entrepreneur in 1994; zero otherwise.¹⁷ In all of our regressions, we account for a large set of demographics and for household net wealth. Our demographic controls include: household age in 1989, age squared, household education attainment dummies, race controls, sex of household head controls, family size, marital status in 1989 and change in marital status between 1989 and 1994, average family labor income between 1984 and 1988, average family labor income squared, whether the head was recently employed and whether the household had owned a business at anytime in the recent past.

As in other studies, we find that net wealth is significant, even though in our sample, it is only significant at the 10% level. Note that we can reproduce the results of other studies including

talents and abilities or different motives to save than the rest of the population. When we regress entrepreneurship on a large set of controls and wealth in the *PSID*, *HRS*, and *NLSY*, we find that wealth is statistically significant, but overall the estimates are small. Results from the *PSID* sample suggest that every \$100,000 of wealth raises the probability of being an entrepreneurs by 6.2 percentage points (1.35 percentage points if we do not exclude outliers). Estimates are smaller for the *HRS* and *NLSY* samples; every \$100,000 raises the probability by 3.2 and 3.4 percentage point respectively. For brevity, estimates are not reported, but are available from the authors upon request.

¹⁷We report the results of other dependent variables in Appendix Table A3. Results are very similar to those reported in Table 4. The specification chosen in Table 4 is comparable to the one chosen by the papers reviewed in Section 2. We

Evans and Jovanovic (1989), Evans and Leighton (1989), Quadrini (1999), and Gentry and Hubbard (2001). Contrary to some of these authors, we also look at the economic significance of the estimates. In our sample, if one gives households an additional \$100,000 (just under the 80th percentile of the wealth distribution for the non-entrepreneurs in our sample; see Table A2), the probability of becoming an entrepreneur only increases by 0.015 percentage points. Given that the mean probability of entering is 0.087 percentage points, increasing households' wealth by a very large amount (over three times the median wealth) only results in a 16% increase in the probability of becoming a business owner.

As discussed in Section 2, if liquidity constraints are driving the wealth-business start-up correlation, we would predict that the incremental impact of another dollar of wealth on the probability of starting a business would be a decreasing function of wealth when wealth is sufficiently large. At large wealth levels, the borrowing constraint will not be binding. In column II of Table 4, we explicitly test this implication by replacing the level of wealth in the regression by a set of wealth dummies. We includes six wealth dummies representing whether the household belongs to the 2nd wealth quintile, the 3rd wealth quintile, the 4th wealth quintile, the 80th-90th percentile of the wealth distribution, the 90th - 97th percentile of the wealth distribution, and the top 3% of the wealth distribution (the first quintile of the wealth distribution is the omitted category). The cutoffs for the different wealth dummies are reported in Table A2.

Estimates from this regression strongly contradict the theoretical predictions. We find that only the top 3% of the wealth distribution is statistically significant at any standard level. If households reside in the top 3% of the wealth distribution (households holding more than \$370,000 in net worth), they are 0.162 percentage points more likely to become business owners. At low levels of wealth, the probability that a household becomes an entrepreneur is *not* increasing in wealth. There is no statistical difference in the propensity to become a business owner between those with

have also tried different econometric specifications, such as logit and probit regressions, but the main results do not change.

\$100,000 in net worth and those with \$10,000 in net worth, all else equal. Given that the median amount of business capital needed to start a business is less than \$23,000 (*NSSBF* data), our empirical findings cast doubts as to whether liquidity constraints are driving the positive correlation between wealth and business start-ups. It should be noted that the coefficient on the dummy for households in the top 3% of the wealth distribution is statistically significantly higher than the coefficient on the dummy for households in the 90th - 97th wealth percentile (p -value = 0.098). Again, we can reject a central tenant of the liquidity constraint theory, i.e., that after a certain level of wealth, the incremental increase in the probability of starting a business is decreasing in household wealth.

4.2 Wealth, the Transition into Entrepreneurship, and Business Type

Starting capital is more important for some types of businesses than others. For example, little initial capital may be needed to start a barber shop, while large amounts of initial capital may be needed to start a manufacturing business. Differences in capital needed to start a business across industries are born out in the 1987 *NSSB* data (summarized in Appendix Table A4). On average, starting a business in the construction or service industries requires less than \$20,000 in initial capital. Conversely, firms in all other industries require starting capital between double and triple that amount.

Using data from the *PSID*, we can test whether household wealth predicts starting a business that requires high starting capital.¹⁸ Using the industry codes, we divided business owners into two groups: those in industries which required low starting capital (construction and services) and those in industries which required high starting capital businesses (all other businesses). In the 1993 *PSID* data, 52.8% of businesses reported being in the service or construction industry. The number is close to the fraction of firms in the construction and service industry reported in the 1987 *NSSBF* (41.2% - Appendix Table A4). Given that the *PSID* is a sample of households and the *NSSBF* is a

sample of firms, it is not surprising that the fractions between the two samples do not perfectly match.

Table 5 shows the results of linear probability regressions with two different dependent variables: whether the household starts a service or construction business and whether the household starts a more capital intensive business. To focus our discussion, we suppress the coefficients on other independent variables and focus on the wealth coefficients only. Wealth does appear to be much more important for capital intensive businesses. The coefficient on wealth in a regression predicting starting a business in the service or construction industry is negative and not statistically different from zero ($-2.28 \text{ E-}8$ ($5.74 \text{ E-}8$)). On the other hand, wealth is economically large, positive, and statistically different from zero in the regression predicting whether a household starts a non-service, non-construction business ($2.66 \text{ E-}7$ ($8.62 \text{ E-}7$)). A \$100,000 increase in wealth increases the probability of starting a non-service, non-construction firm by 2.7 percentage points. Given that the base probability of starting a non-service, non-construction business is 4%, such an increase in wealth represents a 67.5% increase over the base probability of entering.

However, like the results from Table 4, all the effects come from the top of the wealth distribution (top 10%). There is no statistical difference in the probability of starting a capital intensive business between someone with \$15,000 in wealth and someone with \$150,000 in wealth. We do not see an increasing effect of wealth on the probability of business ownership at low levels of wealth and a diminished additional effect of wealth at higher levels of wealth, as predicted by the model of entrepreneurial choice under liquidity constraints described in Section 2.

5 Some Endogeneity and Selection Issues

As we have mentioned before, household wealth is not an ideal proxy for whether a household is liquidity constrained. The fact that wealth has predictive power as to whether a household

¹⁸ The *PSID* has not coded occupation and industry data for the 1994 survey year yet. As a result, we restrict our analysis to non-business owners in 1989 who reported owning a business in 1993. For all households who reported owning a business in 1993, the *PSID* coded the primary industry (2 digit) for that business.

becomes a business owner does not imply that liquidity constraints exist and bind. If high wealth households have high entrepreneurial ability, wealth would significantly predict future entrepreneurship even in a world where liquidity constraints are non-binding. Conversely, due to sample selection issues, household wealth could have no predictive power as to whether a household becomes an entrepreneur even in a world where liquidity constraints do bind. By construction, high wealth households in our sample are households that have chosen not to become business owners during earlier periods. However, these households may be a non-representative sample of high wealth households in general (perhaps because they have lower entrepreneurial abilities). Such selection could lead us to reject the hypothesis of liquidity constraints, even in a world where liquidity constraints bind. Suppose that low wealth households cannot become business owners because of imperfect capital markets, while high wealth households are not business owners because they have less of a preference for business ownership (revealed by their perpetual decision not to become business owners). In such a case, wealth would appear to have no effects on entrepreneurial propensities while, in fact, liquidity constraints exist and bind.

To address the potential sample selection issues and the endogeneity between current wealth and other non-wealth factors that drive the decision to become an entrepreneur, we use three approaches. These are rather difficult issues to address and we will show that our results are not simply driven by our empirical specification. First, we look at how *changes* in (non-business) wealth between 1984 and 1989 affect the decision to become a business owner between 1989 and 1994 for a sample of non-business owners in 1989. Are households who had wealth increases in the recent past more likely to become entrepreneurs, all else equal? Second, we focus on a sample of young households for whom the above sample selection issue is less of a problem. Are wealthy young households more likely to become entrepreneurs than poorer young households? We also examine other groups, which are more likely to be liquidity constrained. Finally, we instrument for changes in wealth using variables that affect wealth, yet, in the absence of liquidity constraints,

should be orthogonal to the decision to become a business owner. We discuss all of these methods below.

5.1 Changes in Wealth and the Transition into Entrepreneurship

Instead of looking at the level of wealth for non-business owners in 1989, we explore whether households that experienced large increases in wealth prior to 1989 were more likely to become business owners between 1989 and 1994. As noted above, one drawback of using the stock of wealth in 1989 as a control for household liquidity is the fact wealthy non-business owners may not be a representative sample (the sample may over-represent those less likely to start a business). To mitigate this problem, we look at households that had large recent wealth gains. If liquidity constraints were present, increases in wealth should alleviate the constraint and predict business entry.

Empirical results reported in Table 6 (regressions I) show that changes in wealth between 1984 and 1989 are not related to transition into entrepreneurship. The size of the change in wealth also did not matter; when we consider dummies for different values of changes in wealth, we find that those that experienced a large positive gain in wealth are no more likely to start a business than those who experienced a small change in wealth.

We have also examined whether changes in wealth are correlated with the type of businesses entrepreneurs start (Table 6, regressions II and III). There is not much evidence that changes in wealth have an effect on starting businesses which require higher starting capital (non-construction, non-service businesses). If any, we find evidence that large and positive changes in wealth are related with starting businesses that require low starting capital. Overall, the evidence provided in this table offers little support in favor of liquidity constraints.

5.2 Wealth and the Transition into Entrepreneurship in Ex-Ante Liquidity Constrained Samples

In this subsection, we look at the effect of initial wealth and the 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 and minorities (blacks and female) entrepreneurs. Theory predicts there should be a greater positive association between wealth (and changes in wealth) and the transition into entrepreneurship when liquidity constraints are more likely to bind. Results are reported in columns I and II of Table 7.

When we consider the transition into entrepreneurship for young households in the *PSID* (respondents younger than 40 in 1989), we find that net wealth is not statistically significant. This result is not sensitive to the age cut-off imposed on the data. If we restrict our sample to households less than 35 years of age in 1989 or 30 years of age in 1989, the results remain identical (coefficient on wealth in these regressions are: 1.08 E-7 (1.66 E-7) and 2.53 E-7 (2.09 E-7) respectively; standard errors in parentheses).¹⁹ Looking at young households who did not have the opportunity to become business owners in earlier periods minimizes the selection issue. By looking at households before they have a chance to select into business ownership causes the sample of non-business owners to be less contaminated by households who have repeatedly chosen not to become an entrepreneur.

Wealth and the change in wealth are also not statistically significant for black entrepreneurs. These results mirror the findings of Meyer (1990). Nor is wealth or the change in wealth significant for female entrepreneurs. Thus, in every group, which is potentially likely to face liquidity constraints, we do not find any evidence that net worth has any effects on the probability of becoming an entrepreneur.

Including a series of wealth dummies for the household's wealth quintile (defined using the young sample's wealth distribution) - with the first wealth quintile omitted - in the place of the

household's wealth level, leads to similar size and significance patterns as reported in the second column of Table 4. Only the coefficient on the top wealth quintile is economically large, although none of the coefficients on any of the wealth quintile dummies are statistically different from zero.

5.3 An Instrumental Variables (IV) Approach

The results in Tables 4 - 7 already cast doubts on whether liquidity constraints are an important deterrent to entrepreneurship. We have shown that wealth only matters if one has more than \$370,000 in initial net assets (top 3%), that changes in wealth does not predict entry into entrepreneurship, and wealth does not matter for those with a higher ex-ante probability of being liquidity constrained. However, we do find that wealth is correlated with business start-up for firms that require more starting capital (Table 5). An explanation of this result is that individual net worth in 1989 is proxying for household preferences or financial ability, which is also correlated with the decision to become an entrepreneur.

Other authors have used an alternative approach to address this problem. For example, Holtz-Eakin, Joulfaian and Rosen (1994) and Blanchflower and Oswald (1998) use inheritances as a proxy for net wealth. In our sample, if we use inheritances as an instrument, we find that wealth is significantly related to becoming a business owner. For our full sample, the coefficient on wealth - instrumented with inheritances received in 1988 - in a regression similar to that reported in column I of Table 4 was 9.27 E-6 (standard error = 5.36 E-6). However, as discussed in section 2, inheritances may not be a good instrument given that, perhaps for tax reasons, many businesses are passed on intergenerationally. We provide further evidence of this fact by using inheritances as an instrument for wealth in our regressions where we predict business types.

Theory says that inheritances should be more important for those wanting to start a capital intensive business. We find that net wealth instrumented using inheritance predicts starting a service or construction business, but has *no* power for predicting non-service, non-construction

¹⁹ This is consistent with the results of Dunn and Holtz-Eakin (1995).

business start-ups (coefficients, respectively: 1.03 E-5 (5.63 E-6) and -1.45 E-6 (7.89 E-7); standard errors in parentheses). The point estimate on inheritance instrumented wealth in the regression predicting starting a capital intensive business is actually negative. These results do not support the liquidity constraints theory. In this case, we expect inheritances to have the greatest impact on start-ups with high initial capital requirements. Supporting our hypothesis that inheritances are simply proxying for the intergenerational transfer of businesses, the *NSSBF* data document that construction firms are statistically more likely to be inherited than non-service, non-construction firms.²⁰

We further note that the sample used by Holtz-Eakin, Joulfaian and Rosen (1994) is largely composed of very wealthy individuals (data is from the IRS estate tax records and returns with total assets over \$1 million were selected at a 100 percent rate). These households already had large amounts of wealth; the mean value of liquid asset reported in their sample is as large as \$325,800 (in 1982 dollars), an amount that is far beyond what is needed to start a business in our *PSID* sample. Their results seem instead consistent with our findings reported in Table 4; it is mainly those at the very top of the wealth distribution that are driving the correlation between business start-up and wealth.²¹

In Table 8, we further explore this issue by showing instrumental variable regressions, where we examine the effect of changes in liquidity which are independent of the household's propensity to become a business owner. For our sample of *PSID* households, we use two instruments for movements in household liquidity: whether the household received an insurance settlement in 1988 and regional variation in housing prices between 1985 and 1988. The exogenous receipt of a (large) sum of money should relax liquidity constraints for those who are otherwise constrained. Note that as many as 6% of respondents in the *PSID* received an insurance settlement in the years

²⁰ Service firms, however, are equally likely to be inherited.

²¹ There is evidence that households at the top of the wealth distribution are disproportionately more likely to receive inheritances than other households. Using data from the 1989 SCF, Wolff reports that 48% of households with 1 million dollar in wealth or more (in 1998 dollars) received an inheritance, gift or other wealth transfers, while the percentage drops to 8.4% for households who have wealth below \$25,000.

prior to our analysis. Additionally, data from the *PSID* indicate that 5% of those who received an insurance settlement became business owners between 1989 and 1994. Thus, numbers are not small for this item.²²

To explore another measure of availability of funds, we make use of regional changes in home values from 1985 to 1988, *net of changes* in regional economic conditions. In many U.S. states, housing prices increased in that time period creating a capital gain for many home-owners. To calculate the regional appreciation in house prices, we proceed as follows: We first regress the changes in the value of homes for non-moving home owners in the *PSID* during 1985-1988 on household demographic variables (household age, age squared, income, family size and structure, race and education), region dummies, and state economic controls including the level of state GDP per capita in 1985, the growth rate of state GDP per capita between 1985 and 1988, and the state rate of unemployment rate in 1985-1988.²³ The regional variation captured by the region dummies is the regional variation in house prices (net of changes in economic conditions in the states comprising the region). We use this variation in house prices across regions as an instrument for windfalls to household wealth.

Two things should be noted about this instrument. First, from the stance of relaxing liquidity constraints, it is not important whether households perceive this change to be permanent. As long as lenders are willing to lend to households based on their housing equity at a given point in time, households can borrow against this increased housing equity to relax any liquidity constraint they face. There is much empirical evidence that lenders are willing to lend (and households are willing to borrow) when households receive large capital gains on housing (Hurst and Stafford, 2001). Second, regional movements in business conditions, not proxied by our economic controls, could cause both changes in house prices and changes in desire for households in that region to become business owners. If this latent, unobserved variable results in a positive correlation in house prices

²² One potential criticism of this instrument is that households who are more prone to accidents also display a lower aversion to risk and, thus, are more likely to become entrepreneurs. To overcome this potential problem, we experiment

and the propensity to start a business (a potentially likely scenario given that both house prices and the propensity to start a business covary positively with business conditions), our IV procedure will be biased towards finding net worth being significant in the business ownership regression.

The first stage regression for our sample indicates that our instruments have predictive power for net wealth (see Appendix Tables A5; the *F*-test on the joint significance of both instruments in regression III is 9.1).²⁴ Results for this first stage regression are in line with other works (Hurst and Stafford (2001); Engelhardt (1996); and Skinner (1996)). For example, it is found that households save approximately 90% of their housing windfall gains (and we cannot reject the hypothesis that households save 100% of the gain), and they save approximately 54% of the insurance settlement.

Looking at the second stage in the whole sample in Table 8 (Panel A, regression I), we find that the coefficient on wealth is always negative (although, none are statistically different from zero). Thus, when considering a more exogenous measure of liquidity than simply net wealth, our estimates offer little evidence supporting the importance of liquidity constraints. Not only is wealth not significant in the total sample, but it is also not significant in any of the sub-samples that are more likely to be liquidity constrained. We have examined the IV estimates among young, black, and female entrepreneurs. Net worth was not statistically significant in any of these groups in the OLS estimates (Table 7), and it is also not significant in the IV estimates (Table 8, Panel A, regressions 2-4).

We additionally investigate whether exogenous movements in wealth affect the type of business that an entrepreneur starts. Contrary to the OLS estimates reported in Table 5, net wealth is not statistically significant in any of the IV estimates of the effect of wealth on business type (Table 8, Panel B). Exogenous wealth movements have no predictive power for whether a household starts a capital intensive (non-construction, non-service) business.

with different sets of instruments.

²³ We included nine region dummies defined as U.S. census regions.

²⁴ As an additional check of the validity of our instruments, we performed the over-identification test (for regression III of Table A5). We cannot reject the over-identifying restriction (p -value = 0.403).

To summarize: Although, we are able to replicate the fact that instrumenting wealth with inheritances causes wealth to be significantly and positively related to starting a business, we find that this relationship breaks down when using potentially more exogenous instruments for wealth or when looking at businesses which require higher starting capital and should therefore be more likely to face liquidity constraints. It is likely that inheritances are simply capturing institutional factors that cause businesses to be transferred intergenerationally. These results cast further doubt on the existence and importance of binding liquidity constraints for small businesses.

5.4 Liquidity Constraints and Optimal Business Size

One topic that we do not address in this paper is whether liquidity constraints prevent potential business owners from achieving their optimal business size. For example, some authors, such as Gentry and Hubbard (2001), that consider only business with more than \$5,000 of business equity, may end up focusing on relatively bigger starting firms and that may explain some of the differences in our results. One can imagine that liquidity constraints do not prevent households from becoming entrepreneurs, but cause them to start smaller than desired. Due to data limitations, we cannot address this question; the *PSID* does not ask respondents about the size of their business, only the market value of their firm. Wealthy households may be better able to leverage their firm causing them to have a larger firm but with low business equity. We perform only some cursory analysis and test whether, conditional on starting a new business between 1989 and 1994, wealthier households started a firm which had larger business equity in 1994 (we considered several values for business equity). The results were similar to what we found in the entering decision. Wealth is significant in the OLS regression, but we find that all the power comes from the top of the wealth distribution. Furthermore, instrumenting for wealth using the instruments discussed in the previous section causes wealth to enter insignificantly in the regressions predicting business size.

Knowing if liquidity constraints affect the size of the business is relevant, but the policy implications of such a finding may be different than if it were found that liquidity constraints

prevent business ownership all-together. Hence, focusing on whether liquidity constraints affect business start-ups is important regardless of whether or not liquidity constraints affect initial business size. Nevertheless, future research should attempt to more seriously address this latter issue.

6. Parental Wealth, Parental Occupation, and the Entrepreneurship Choice

If liquidity constraints are important, one can imagine that there are other means of acquiring the capital needed to start a business besides drawing on the private stock of wealth. For example, households who come from wealthier families may be able to receive loans or take advances on their expected inheritances to fund business enterprises. Simple statistics from Table 3 documents that the wealthy entrepreneurs are more likely to receive inheritances and money and assets from relatives, perhaps suggesting that they themselves come from wealthy families. To further understand the relationship between wealth and business start-up, we explore the role of parental wealth in affecting entrepreneurship. In 1988, the *PSID* asked all respondents (both ‘heads’ and ‘spouses’) to report the estimated net worth of their parents. Additionally, upon entering the survey, households are asked detailed questions about parental occupation. These questions do not ask if the head or the spouse’s parents owned a business, but do ask if the parents were self-employed.²⁵

In column I of Table 9, we rerun the regression from column I in Table 4 with additional controls for parental net worth and parental self-employment on a sample of young households.²⁶ We control for parental self-employment to take account of the parent-child correlation in occupations (Lentz and Laband (1990, 1993), Hout and Rosen (1999)). The *PSID* only asks

²⁵ Of our main sample of households, the probability of reporting owning a business conditional on claiming to be self-employed is only 54%. With this in mind, it should be noted that having a measure of parental self-employment is not the same as having a measure of parental business ownership. Charles and Hurst (2001) link *PSID* parent child pairs and regress child business ownership on parental business ownership and parental wealth (the latter two reported by the parent). The results are similar to what we report in Table 9.

²⁶ Again, because the *PSID* does not measure the top 1% of the wealth distribution very well, we truncated the top 1% of the parental wealth distribution. The regression includes the same controls as those used in Table 6, as well as dummy variables for whether the head and the spouse had parents who were alive.

questions about parental wealth if the household's parents are alive. We restrict our analysis to younger households because, for most of the older households, there is no information on parental wealth. The results indicate that both parental self-employment and parental wealth are significant predictors of whether the child becomes an entrepreneur between 1989 and 1994. The coefficient on the parental self-employment variable is rather large: 0.048 percentage points. Given that the base probability of the child becoming a business owner is 0.088 percentage points, children of self-employed parents are 55% more likely to become an entrepreneur than children of non self-employed parents. The effect of parental wealth is much smaller. If parental wealth increases by \$100,000, the probability that the child becomes a business owner increases by 0.005 percentage points (an increase of 5.7% over the base probability of entering).²⁷

Upon further examination, it appears that the significance of parental wealth is not driven by the existence of binding liquidity constraints. As before, we include dummy variables for having parental wealth in different portions of the parental wealth distribution (Table 9, column II). The only parental wealth category that significantly predicted the probability that a child becomes a business owner was those parents who had wealth in the top 3% of the parental wealth distribution. Having such rich parents increases the probability that the child would become a business owner by 0.072 percentage points (an increase of 82%). None of the other parental wealth categories significantly predicted child business ownership (up to the 97th percentile of the wealth distribution). Again, the lack of impact of parental wealth (more precisely, having parents with modest to large amounts of wealth) on the entrepreneurship decision suggests that liquidity constraints are not an important deterrent to business ownership.

²⁷ This number is similar in magnitude to that reported by Dunn and Holtz-Eakin (1995).

7. Net Worth, Parental Wealth and Entrepreneurial Survival

To further analyze the role and effects of wealth, we examine whether own and parental wealth predict not just the probability of starting a business, but the probability that new businesses would survive. To answer this question, we further explore the panel aspect of the PSID and construct event studies for new business owners. To enter our sample, the household had to become a business owner at some time between 1984 and 1989, had to not be a business owner in the two years prior to becoming a business owner and had to remain in the sample for five years after becoming a business owner. There are 931 such households in our PSID sample.

Table 10 shows the results from a linear probability regression as to whether the household survived one year after becoming a business owner (columns I and II) and whether the household survived five years after becoming a business owner (columns III and IV) as a function of income, demographic, and wealth controls. In particular, columns I and III include the level of the household's own wealth, the level of the household's parents wealth and whether the household's parents were self-employed as additional controls.²⁸ Columns II and IV have parental and own wealth dummies as controls. In neither the one-year survival regressions nor the five-year survival regressions is own wealth statistically significant. Parental wealth is significant in both the one-year and the five-year survival regression. However, when we include dummies for parental wealth, we find that parental wealth is significant only for those at the top 20% 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, in any case, above the median value of parental wealth. These results are broadly consistent with the work of Holtz-Eakin, Joulfaian and Rosen (1994). While they found that the coefficients of own wealth is significant statistically, it is essentially zero

²⁸ PSID wealth is only measured at five-year intervals. As a result, 1984 wealth was assigned as the own wealth measure for any households who became business owners between 1984 and 1988. Parental wealth was as of 1988 for all households. Additional controls include a dummy for whether the household's parents are alive. The top 1% of parental wealth and own wealth were truncated.

economically. According to their findings, a \$100,000 bequest increases the probability of survival by 0.009 percentage points, where the base survival rate for their sample was 0.730.

8. Conclusion

In this paper, we examine whether liquidity constraints are a deterrent to business ownership. Many previous empirical studies have shown that wealth is correlated with business start-up and interpreted this finding as evidence of binding liquidity constraints. Our work shows that such conclusion is premature. Wealth measures more than availability of funds and can proxy for, among other things, talents and abilities, attitudes towards risk, and intergenerational transfers that are also correlated with the propensity to start a business. In fact, when we consider more appropriate measures of liquidity and accessibility of funds than simply net wealth, we do not find any evidence that liquidity constraints play a role in affecting entrepreneurship.

While theoretical models of the decision to become entrepreneurs in the presence of liquidity constraints predict a positive relationship between business start-up and wealth, the shape of that relationship has not been thoroughly investigated. It is easy to show that the probability of entering entrepreneurship should be an increasing function of wealth up to the level where the liquidity constraint ceases to bind. After that, the probability of business ownership will be independent of household wealth. In other words, the impact of wealth on the probability of becoming an entrepreneur should be greatest at lower levels of wealth. In our work, we test this prediction empirically and we find that it is strongly rejected. It is those at the very top of the wealth distribution that drives the correlation between wealth and the probability to start a business. Increases in wealth do not predict business ownership up until the 97th percentile of the wealth distribution. It is important to look at which households in the wealth distribution are responsible for the correlation between wealth and entrepreneurship, as the correlation per se may tell us little about the relationship between wealth and business start-up.

We also provide other tests of liquidity constraints. For example, we look at businesses that require high levels of starting capital and at groups which are more likely to be liquidity constrained (minority, female and young households). We find there is no correlation between wealth and the propensity to become a business owner. Additionally, we use data on insurance settlements and capital gains on home equity to instrument for wealth and find that it has no impact on entrepreneurship. We can replicate the results of other papers and show that some previous results are also not supporting the theory of liquidity constraints.

Taken together, our evidence provides little support to the hypothesis that liquidity constraints are an important impediment to business ownership. Our work suggests that there are many differences between entrepreneurs and non-entrepreneurs and those differences should be taken seriously into account when studying the decision to become an entrepreneur. It additionally shows that it is very important to study closely the behavior of the wealthy.

Given the large policy initiatives by government agencies, such as the *SBA*, and the size of starting capital in the majority of businesses, our results are far from being implausible. With that in mind, we do not distinguish whether liquidity constraints are not important because government policies aimed at alleviating them are working effectively or whether large amounts of capital are simply not needed to start a business. Either way, our results suggest that if policy makers are interested in further stimulating business ownership, providing more subsidized loans or loan guarantees may prove to be rather ineffective. These policies may be ineffective even for groups, such as minorities (Blacks, female), whose rate of entrepreneurship is particularly low.

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Table 1 - Percent 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)

<i>Wealth Distribution (upper cut off in parentheses)</i>	<i>Percent of Entrepreneurs in the Wealth Distribution</i>	<i>Percent of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution</i>
Quintile 1 (\$2,800)	0.040 (0.197)	0.356 (0.482)
Quintile 2 (25,400)	0.059 (0.236)	0.446 (0.499)
Quintile 3 (75,500)	0.105 (0.306)	0.198 (0.399)
Quintile 4 (199,000)	0.124 (0.329)	0.203 (0.403)
80 th - 90 th percentile (359,200)	0.277 (0.448)	0.121 (0.326)
90 th - 97 th percentile (793,800)	0.319 (0.464)	0.122 (0.329)
Above 97 th percentile	0.621 (0.486)	0.062 (0.242)

Data Source: 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)

<i>Wealth Distribution (upper cut off in parentheses)</i>	<i>Percent of Entrepreneurs in the Wealth Distribution</i>	<i>Percent of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution</i>
Quintile 1 (20,132)	0.044(0.206)	0.544(0.502)
Quintile 2 (74,900)	0.077(0.267)	0.370 (0.485)
Quintile 3 (151,100)	0.143(0.350)	0.284(0.453)
Quintile 4 (309,100)	0.226(0.418)	0.199(0.400)
80 th - 90 th percentile (541,900)	0.328(0.470)	0.116(0.321)
90 th - 97 th percentile (1,433,800)	0.530(0.500)	0.090(0.287)
Above 97 th percentile	0.806(0.396)	0.039(0.193)

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

PANEL C: 1997 National Longitudinal Survey of Youth (NLSY)

<i>Wealth Distribution (upper cut off in parentheses)</i>	<i>Percent of Entrepreneurs in the Wealth Distribution</i>	<i>Percent of Entrepreneurs (out of Total Entrepreneurs) with Zero Business Equity in the Wealth Distribution</i>
Quintile 1 (1,500)	0.029(0.167)	0.462(0.508)
Quintile 2 (20,500)	0.038(0.192)	0.460 (0.506)
Quintile 3 (58,700)	0.087(0.282)	0.330(0.473)
Quintile 4 (147,700)	0.109(0.313)	0.250(0.435)
80 th - 90 th percentile (279,700)	0.227(0.420)	0.148(0.357)
90 th - 97 th percentile (716,900)	0.344(0.476)	0.105(0.308)
Above 97 th percentile	0.807(0.396)	0.043(0.204)

Data Source: 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

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

Data source: 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

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

Data source: All *HRS* respondents who reported owning a business in 1992. Data weighted using *HRS* sample weights. All values are in 1996 dollars.

PANEL C: 1997 National Longitudinal Survey of Youth

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

Data source: 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 Non-Entrepreneurs, Entrepreneurs, and Wealthy Entrepreneurs in the 1992 HRS Sample

<i>Variables</i>	<i>(I) Non-Business Owners (4,790 obs)</i>	<i>(II) All-Business Owners (1,038 obs)</i>	<i>(III) Wealthy^a Business Owners (237 obs)</i>	<i>t-stat: Difference (I) - (II)</i>	<i>t-stat: Difference (II) - (III)</i>
Age of Respondent	54.9	54.6	55.5	2.71	-4.09
Percent Male	0.472	0.596	0.666	-7.43	-2.42
Percent Hispanic	0.088	0.035	0.009	6.28	2.86
Percent Black	0.118	0.041	0.018	10.21	2.32
Percent with High School Diploma	0.375	0.317	0.231	2.43	3.00
Percent with Some College Education	0.189	0.282	0.280	-7.13	0.32
Percent with College Education	0.111	0.142	0.191	-3.71	-2.93
Percent with More than a College Education	0.086	0.141	0.228	-5.74	-4.79
Percent Married	0.624	0.825	0.856	-13.04	-1.71
Percent in Excellent Health	0.234	0.347	0.441	-8.30	-3.03
Percent who are the Most Risk Averse	0.616	0.602	0.611	0.47	-0.53
Percent who are the Least Risk Averse	0.119	0.133	0.144	-0.43	-0.63
Score on Ability to Think Quickly (5 is highest score)	3.68	3.98	4.10	-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
Percent who Experienced Unemployment in the Past	0.343	0.222	0.108	7.91	4.92
Percent who Experienced Negative Financial Shocks in the Past	0.326	0.357	0.249	-1.85	3.78
Percent with at least one Parent with a High School Diploma	0.447	0.597	0.667	-10.15	-2.95
Probability to give Financial Help to Family in next 10 years	0.391	0.439	0.492	-4.11	-2.54
Percent who received an Insurance Settlement	0.055	0.045	0.035	0.94	0.017
Percent who received Money or Major Assets from Relatives	0.071	0.123	0.193	-6.22	-4.13
Percent who received Inheritances	0.184	0.268	0.323	-7.47	-2.55
Percent who expect to leave a Sizeable Inheritance to Heirs	0.393	0.550	0.801	-9.61	-9.40
Percent who have a Pension	0.543	0.311	0.312	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

* Data source: 1992 sample of HRS households. Data weighted using HRS sample weights. All values are reported in 1996 dollars.

* Due to missing values, the means of some variables are reported for smaller sample sizes than the one reported in this table.

^a 'Wealthy business owners' refers to business owners who are in the top quartile of business owners' non-business wealth distribution.

**Table 4 - Who Becomes an Entrepreneur? The Effect of Household Wealth Levels.
Linear Probability Regressions**

<i>Variables</i>	<i>I</i>	<i>II</i>
Age of Household Head in 1989	-0.007 (0.005)	-0.008 (0.005)
Age Squared	6.95 E-5 (6.27 E-5)	7.36 E-5 (6.25 E-5)
Dummy: Exactly High School Education in 1989	0.012 (0.015)	0.010 (0.015)
Dummy: Only Some College Education in 1989	0.018 (0.018)	0.016 (0.018)
Dummy: College Education or Higher in 1989	0.050 (0.021)	0.048 (0.021)
Dummy: Household Head Black in 1989	-0.047 (0.010)	-0.047 (0.010)
Dummy: Household Head Female in 1989	-0.024 (0.019)	-0.023 (0.018)
Household Family Size in 1989	0.006 (0.005)	0.006 (0.005)
Dummy: Household Head Married in 1989	-0.004 (0.022)	-0.005 (0.022)
Dummy: Household Head Became Married: 1989-1994	0.059 (0.035)	0.057 (0.034)
Dummy: Household Head Became Divorced: 1989-1994	-0.013 (0.040)	-0.013 (0.039)
Average Family Labor Income: 1984-1988	-1.71 E-8 (5.76 E-7)	3.24 E-8 (6.03 E-7)
Average Family Labor Income Squared	4.53 E-12 (3.27 D-12)	4.33 E-12 (3.29 D-12)
Unemployed Anytime Between 1986-1988 (Head)	0.028 (0.016)	0.030 (0.016)
Owned a Business Anytime Between 1984 and 1988	0.088 (0.020)	0.085 (0.021)
Household Non-Business Net Worth in 1989	1.46 E-7 (8.51 E-8)	
Dummy: Household Wealth 20 th - 40 th percentile		0.004 (0.017)
Dummy: Household Wealth 40 th - 60 th percentile		0.033 (0.022)
Dummy: Household Wealth 60 th - 80 th percentile		0.034 (0.023)
Dummy: Household Wealth 80 th - 90 th percentile		0.010 (0.026)
Dummy: Household Wealth 90 th - 97 th percentile		0.038 (0.035)
Dummy: Household Wealth > 97 th percentile		0.162 (0.076)

* Sample: All *PSID* non-business owners in 1989 between the ages of 22 and 65 who were not retired. The top 1% of the wealth distribution was truncated. The number of observations is 3,425. See text for explanation and further sample restrictions. Regressions include state economic controls and a constant. Adj. R-squared, respectively, for regressions (I) and (II): 0.051 and 0.054. All dollar values are in 1996 dollars.

* Dependent variable: Dummy variable equal to 1 if household owned a business in 1994 (percent of sample = 0.087).

* Standard errors are in parentheses. Coefficients reported in bold are significant at the 10% level.

**Table 5 – Who Becomes an Entrepreneur? The Effect of Household Wealth.
Linear Probability Regressions on Alternate Business Types**

Regressions/Samples	<i>Regression Coefficient</i>						
	Wealth Level	2 nd Quintile	3 rd Quintile	4 th Quintile	80 th -90 th Percentile	90 th - 97 th Percentile	Top 3 Percentile
I. Dependent Variable: Households who Started a Service or Construction Business by 1993							
A. Regression With Level of Wealth	-2.28 E-8 (5.74 E-8)						
B. Regression With Wealth Dummies		-0.019 (0.014)	-0.002 (0.018)	-0.004 (0.017)	-0.027 (0.020)	-0.012 (0.026)	0.011 (0.048)
II. Dependent Variable: Households who Started a Non-Service, Non-Construction Business By 1993							
A. Regression With Level of Wealth	2.66 E-7 (8.62 E-8)						
B. Regression With Wealth Dummies		0.002 (0.011)	0.026 (0.013)	0.012 (0.014)	0.027 (0.018)	0.062 (0.029)	0.176 (0.068)

* Sample: All *PSID* non-business owners in 1989 between the ages of 22 and 65 who were not retired. The top 1% of the wealth distribution was truncated. The number of observations is 3,425. See text for explanation and further sample restrictions. Regressions include state economic controls and a constant.

* All regressions include the income and demographic controls included in Table 4. All dollar values are in 1996 dollars.

* Coefficients in bold are significant at the 10% level. Standard errors are in parentheses.

* Percent starting a construction or service industry business: 0.045; Percent starting a non-construction or a non-services business: 0.041.

**Table 6 – Who Becomes an Entrepreneur? The Effect of Changes in Household Wealth.
Linear Probability Regressions**

Regressions/Samples	<i>Regression Coefficient</i>						
	Change in Wealth	2 nd Quintile	3 rd Quintile	4 th Quintile	80 th -90 th Percentile	90 th - 97 th Percentile	Top 3 Percentile
I. Dependent Variable: <u>Households who Started ANY Business by 1994</u>							
A. Regression With Change in Wealth (1984-1989)	-1.24 E-7 (1.08 E-8)						
B. Regression With Change in Wealth Dummies		-0.026 (0.020)	-0.034 (0.020)	-0.032 (0.021)	-0.029 (0.025)	-0.031 (0.027)	0.019 (0.045)
II. Dependent Variable: <u>Households who Started a Construction or Service Business by 1993</u>							
A. Regression With Change in Wealth (1984-1989)	-2.63 E-8 (7.94 E-8)						
B. Regression With Change in Wealth Dummies		-0.021 (0.015)	-0.008 (0.016)	-0.010 (0.017)	-0.033 (0.015)	-0.018 (0.020)	0.053 (0.042)
III. Dependent Variable: <u>Households who Started a Non-Construction, Non-Service Business by 1993</u>							
A. Regression With Change in Wealth (1984-1989)	-5.19 E-8 (1.01 E-7)						
B. Regression With Change in Wealth Dummies		-0.021 (0.015)	-0.019 (0.015)	-0.017 (0.014)	-0.023 (0.017)	-0.001 (0.021)	0.030 (0.040)

* Sample: All *PSID* non-business owners in 1989 between the ages of 22 and 65 who were not retired 1989, who were in the *PSID* sample during 1984 and who did not own a business in 1984. The top/bottom 1% of the change in wealth distribution were truncated. The number of observations is 3,117. See text for explanation and further sample restrictions. Regressions include state economic controls and a constant.

* All regressions include the income and demographic controls included in Table 4. All dollar values are in 1996 dollars.

* Coefficients in bold are significant at the 10% level. Standard errors are in parentheses.

* The 20th percentile, 40th percentile, 50th percentile, 60th percentile, 80th percentile, 90th percentile and the 97th percentile of the change in wealth distribution (change in wealth 1984-1989) are, respectively, as follows: (-\$50,730 ; -\$15,810 ; -\$7163 ; -\$500 ; \$13,294 ; \$37,724 ; \$97,687).

**Table 7 – Who Becomes an Entrepreneur? The Effect of Household Wealth.
Linear Probability Regressions on Alternate Samples**

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

* Regression I reports the results of a regression of the probability that a household enters entrepreneurship between 1989 and 1994 on household wealth in 1989 and all other demographic and income controls used in the regressions reported in Table 4.

* Regression II reports the results of a regression of the probability that a household enters entrepreneurship between 1989 and 1994 on the change in household wealth between 1984 and 1989 and all other demographic and income controls used in the regressions reported in Table 4.

* Regression I sub-samples are restricted to all non-retired households in the *PSID* between the age of 22 and 40 and who did not own a business in 1989.

* Regression II sub-samples are restricted to all non-retired households in the *PSID* between the age of 22 and 40, who did not own a business in 1989 and who were in the sample in 1984 and did not own a business during that year.

* Sample for Regression a: Further restricts sample to households with ages between 22 and 40 in 1989 (2,452 observations for regression I and 2,083 observations for regression II).

* Sample for Regression b: Further restricts sample to black household heads (1,351 observations for regression I and 1,261 observations for regression II).

* Sample for Regression c: Further restricts sample to female household heads (821 observations for regression I and 757 observations for regression II).

* Coefficients in bold are significant at the 10% level. Standard errors are in parentheses.

**Table 8 – Who Becomes an Entrepreneur? The Effect of Wealth.
Instrumental Variable Regressions**

Regressions/Samples	<i>Coefficient on Instrumented Household Net Wealth</i>		
	IV Regression A	IV Regression B	IV Regression C
<u>PANEL A</u>			
Dependent Variable: Households that Become Business Owners By 1994			
1. Full Sample (Table 6, Regression I)	-2.03 E-6 (1.34 E-6)	-3.57 E-7 (1.26 E-6)	-7.14 E-7 (1.03 E-6)
2. Young Sample (Table 7, Regression 1)	-1.50 E-6 (9.59 E-7)	3.06 E-9 (1.16 E-6)	-3.25 E-7 (9.26 E-7)
3. Black Sample (Table 7, Regression 2)	-1.08 E-8 (3.62 E-7)	-2.01 E-6 (1.75 E-6)	-3.54 E-7 (3.66 E-7)
4. Female Sample (Table 7, Regression 3)	-8.24 E-7 (1.44 E-6)	-5.73 E-7 (1.67 E-5)	-8.11 E-7 (1.82 E-6)
<u>PANEL B</u>			
Dependent Variable: Type of Business Started by 1993			
1. Start a Construction or Service Business (Table 5, Regression IA)	1.55 E-6 (3.11 E-6)	5.38 E-7 (9.35 E-7)	7.54 E-7 (9.09 E-7)
2. Start a Non-Construction, Non-Service Business (Table 5, Regression IIA)	-7.83 E-7 (8.65 E-7)	-1.41 E-6 (1.03 E-6)	-1.27 E-6 (8.23 E-7)

* Regression A uses insurance settlements to the household in 1988 as an instrument for household wealth in 1989.

* Regression B uses regional variation in house price appreciation between 1985 and 1988 as an instrument for household wealth in 1989.

* Regression C uses insurance settlements and regional variation in house prices as instruments for household wealth in 1989.

* Standard errors are in parentheses. Coefficients in bold indicate significance at the 10% level.

* Appendix Table A5 shows the results from first stage regressions of household wealth on the instruments.

Table 9 - Who Becomes an Entrepreneur? The Effect of Parental Wealth and Occupation (Young Sample). Linear Probability Regressions

<i>Variables</i>	<i>I</i>	<i>II</i>
Include all Controls for Regressions Reported in Table 6?	Yes	Yes
Household's Own Non-Business Net Worth in 1989	8.37 E-8 (6.99 E-8)	8.78 E-8 (6.98 E-8)
Dummy: Husband/Wife Father a Business Owner?	0.048 (0.023)	0.049 (0.023)
Total Net Worth of Both Husband and Wife's Parents	5.02 E-8 (2.71 E-8)	
Dummy: Parental Wealth 20 th - 40 th percentile		0.024 (0.020)
Dummy: Parental Wealth 40 th - 60 th percentile		0.002 (0.018)
Dummy: Parental Wealth 60 th - 80 th percentile		0.021 (0.019)
Dummy: Parental Wealth 80 th - 90 th percentile		0.032 (0.021)
Dummy: Parental Wealth 90 th - 97 th percentile		0.025 (0.024)
Dummy: Parental Wealth > 97 th percentile		0.072 (0.039)

* Sample: All *PSID* non-business owners in 1989 between the ages of 22 and 45 who were not retired. The top 1% of both household and parental wealth distribution was truncated. The number of observations is 2,829. See text for explanation and further sample restrictions.

* Adj. R-squared, respectively, for regressions (I) and (II): 0.049 and 0.050.

* Regressions also includes controls for whether the head and wife's parents are alive.

* Standard errors are in parentheses. Coefficients in bold are significant at the 10% level.

* Dependent variable: Dummy variable equal to 1 if households owned a business in 1994 (percent of sample = 0.088).

**Table 10 - Who Survives as Entrepreneur? The Effect of Own and Parental Net Worth.
Linear Regressions of One Year and Five Year Business Survival Probabilities.**

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

* Sample: All PSID households who became a business owner between 1984 and 1989. Own and parental wealth truncated at the top 1%. The number of observations is 931.

* Dependent variable: Columns I and II - whether new business owners remained in business 1 year later.

Columns III and IV - whether new business owners remained in business 5 years later.

* Demographic and income controls included household age, age squared, marital status, race, educational attainment, average income for the three years prior to becoming a business owner, income squared and time dummies for the year the household became a business owner. All demographic controls were dated as of the year the household became a business owner.

* Household 1984 wealth was assigned to households who became a business owner in years 1984 - 1988. 1989 wealth was assigned to households who became business owners in 1989.

* Standard errors are in parentheses. Coefficients significant at the 10% level are in bold.

Table A1 - Occupational Breakdown of 1989 PSID Business Owners and Those Who Transition into Business Ownership Between 1989 and 1993

<i>Occupation</i>	<i>I</i>	<i>II</i>
	<i>Sample of All Business Owners in the PSID in 1989</i>	<i>Sample of 1993 PSID Business Owners who were not Business Owners in 1989</i>
Manager	31.34%	17.49%
Skilled Laborer/Craftsmen	14.86	17.27
Farm	1.03	8.77
Transport Operators	5.24	7.49
Sales	6.94	5.95
Engineer	2.97	5.36
Math/Physical and Life Sciences	1.21	3.49
Medical Specialist	3.65	3.36
Machine Operators	2.95	3.00
Computer Specialist	1.90	2.23
Lawyer/Judges	2.12	1.32
Accountant	3.47	1.05
Sample Size	484	233

* Sample for column I: All non-retired PSID households between the ages of 22 and 65 who owned a business in 1989. The top 1% of the wealth distribution was truncated. See text for explanation and further sample restrictions.

* Sample for column II: All non-retired PSID households between the ages of 22 and 65 who did not own a business in 1989 and were business owners in 1993. The top 1% of the wealth distribution was truncated. See text for explanation and further sample restrictions.

* Totals sum to less than 100%. All other occupations had less than 1% per category and included occupations such as therapists, social scientists, clergy, pilots, proofreaders, architects, recreational services, etc.

* We use the information on occupation in 1993 because occupation data have not been coded for 1994 yet.

Table A2 - Means of 1989 PSID Non-Business Owners: Full Sample, Those Who Became a Business Owner in 1990-1994, and Those Who Did Not Become a Business Owner in 1990 - 1994

<i>Variables</i>	<i>Full Sample</i>	<i>Became Business Owner</i>	<i>Did Not Become Business Owner</i>
Age	37.4	35.9	37.5
Percent with a High School Education	0.371	0.296	0.377
Percent with Only Some College Education	0.224	0.296	0.223
Percent with College or More Education	0.263	0.412	0.248
Percent Black	0.165	0.029	0.178
Percent Female	0.244	0.102	0.258
Family Size	2.73	2.84	2.71
Percent Married	0.532	0.621	0.524
Percent who Became Married 1990-1994	0.076	0.137	0.070
Percent who Became Divorced 1990-1994	0.036	0.037	0.036
Average Family Labor Income 1984-1988	39,482	50,715	38,407
Percent Experiencing Any Unemployment 1986-1988	0.201	0.206	0.201
Mean Non Business Wealth	67,087	100,091	63,929
20 th Percentile of Non Business Wealth Distribution	1,320	7,170	1,157
40 th Percentile of Non Business Wealth Distribution	15,096	25,630	13,461
60 th Percentile of Non Business Wealth Distribution	45,290	64,287	43,277
80 th Percentile of Non Business Wealth Distribution	107,438	153,483	104,419
90 th Percentile of Non Business Wealth Distribution	191,414	291,870	185,658
97 th Percentile of Non Business Wealth Distribution	373,645	549,145	360,970
Percent Receiving Insurance Settlement in 1988	0.061	0.047	0.062

* Sample: All non-retired PSID households between the ages of 22 and 65 who did not own a business in 1989. The top 1% of the wealth distribution was truncated. See text for explanation and further sample restrictions.

* Percent who did not own a business in 1989 and did own a business in 1994: 0.087

* All dollar values are reported in 1996 dollars.

**Appendix Table A3 - Who Becomes an Entrepreneur? The Effect of Household Wealth.
Additional Alternate Dependent Variable Specifications. Linear Probability Regressions.**

<i>Variables</i>	I		II		III	
	<i>A</i>	<i>B</i>	<i>A</i>	<i>B</i>	<i>A</i>	<i>B</i>
Include all Controls for Regressions Reported in Table 6?	Yes	Yes	Yes	Yes	Yes	Yes
Household Non-Business Net Worth in 1989	3.10 E-7 (1.14 E-7)		1.16 E-7 (8.33 E-8)		8.68 E-8 (7.43 E-8)	
Dummy: Household Wealth 20 th - 40 th percentile		-0.022 (0.025)		-0.008 (0.015)		-0.003 (0.013)
Dummy: Household Wealth 40 th - 60 th percentile		0.056 (0.029)		0.023 (0.019)		0.018 (0.017)
Dummy: Household Wealth 60 th - 80 th percentile		0.013 (0.030)		0.009 (0.019)		0.007 (0.016)
Dummy: Household Wealth 80 th - 90 th percentile		0.001 (0.035)		0.004 (0.024)		-0.010 (0.019)
Dummy: Household Wealth 90 th - 97 th percentile		0.092 (0.049)		0.011 (0.030)		0.027 (0.027)
Dummy: Household Wealth > 97 th percentile		0.244 (0.087)		0.143 (0.068)		0.097 (0.057)
R-squared of the regression	0.082	0.089	0.023	0.029	0.025	0.030
Mean of Dependent Variable	0.193	0.193	0.041	0.041	0.063	0.063

* Dependent variable for regression I: Dummy variable equal to 1 if the household did not own a business in 1989 and became a business owner anytime between 1990 and 1994.

* Dependent variable for regression II: Dummy variable equal to 1 if the household did not own a business in either 1988 or 1989 and owned a business in both 1993 and 1994.

* Dependent variable for regression III: Dummy variable equal to 1 if the household did not own a business in either 1988 or 1989 and owned a business in any two consecutive years between 1990 and 1994.

* Sample: All non-retired households in the PSID between the age of 22 and 65 who did not own a business in 1989. Top 1% of the wealth distribution was truncated. The number of observations is 3,425. See text for explanation and additional sample restrictions.

* Standard errors are in parentheses. Coefficients in bold indicate significance at the 10% level.

**Table A4 - Starting Capital for New Business Owners
between 1980 and 1987**

<i>Industry</i>	<i>Median Starting Capital</i>	<i>Percent of Firms in Industry Category</i>
Mining	\$37,800	1.2%
Construction	\$9,500	10.9%
Manufacturing	\$47,300	7.9%
Transportation, Communications and Public Utilities	\$47,300	3.0%
Wholesale Trade	\$41,400	8.5%
Retail Trade	\$55,200	33.3%
Insurance and Real Estate	\$36,500	4.8%
Services	\$19,400	30.3%

* Sample: 1987 National Survey of Small Business Finances. All values are reported in 1996 dollars. The number of observations is 1,099.

Table A5 - OLS Regressions of Net Worth for Sample of Non-Business Owners in the PSID: First Stage Regressions

<i>Variables</i>	<i>I</i>	<i>II</i>	<i>III</i>
Age of Household Head in 1989	3,760 (1,418)	3,854 (1,409)	3,854 (1,409)
Age Squared	-5.65 (18.4)	-6.60 (18.2)	-6.64 (18.2)
Dummy: Exactly High School Education in 1989	17,412 (5,493)	17,560 (5,490)	17,464 (5,490)
Dummy: Only Some College Education in 1989	14,312 (6,667)	14,453 (6,689)	14,555 (6,690)
Dummy: College Education or Higher in 1989	27,063 (7,504)	26,187 (7,490)	26,253 (7,490)
Dummy: Household Head Black in 1989	-16,637 (3,683)	-16,483 (3,720)	-16,476 (3,714)
Dummy: Household Head Female in 1989	-614 (5,725)	-529 (5,748)	-440 (5,741)
Household Family Size in 1989	2,607 (1,716)	2,733 (1,689)	2,696 (1,701)
Dummy: Household Head Married in 1989	14,692 (7,246)	14,334 (7,236)	14,544 (7,240)
Dummy: Household Head Became Married: 1989-1994	5,220 (8,697)	4,849 (8,716)	4,994 (8,710)
Dummy: Household Head Became Divorced: 1989-1994	-10,181 (7,448)	-9,235 (7,511)	-9,014 (7,515)
Average Family Labor Income: 1984-1988	1.13 (0.25)	1.11 (0.26)	1.11 (0.26)
Average Family Labor Income Squared	2.84 E-6 (2.05 E-6)	2.93 E-6 (2.10 E-6)	2.94 E-6 (2.09 E-6)
Unemployed Anytime Between 1986-1988 (Head)	-3,887 (4,535)	-3,143 (4,481)	-3,119 (4,478)
Value of Cash Insurance Settlement in 1988	0.498 (0.282)		0.544 (0.281)
Predicted Value of Regional House Price Appreciation		0.889 (0.237)	0.898 (0.237)
State Economic Controls Included	Yes	Yes	Yes
Constant	-144,449 (25,158)	-123,985 (25,238)	-123,698 (25,315)
Adjusted R-Squared	0.352	0.357	0.357

* Sample: All non-retired non-business owning households in the PSID in 1989 between the ages of 22 and 65. Top 1% of net worth truncated. The number of observations is 3,425. See text for explanation and additional sample restrictions.

* Percent who received an insurance settlement: 0.061.

* Conditional mean of the insurance settlement for those receiving a settlement: \$7,506.

* The instruments and their estimates are indicated in bold.