

**BUSINESS OWNERS, FINANCIAL RISK,
AND WEALTH**

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This research was supported by a grant from the Ewing Marion Kauffman Foundation, for which the author is grateful. All errors are the responsibility of the author.

Abstract

Using 1989 to 2007 Survey of Consumer Finances data, this paper addresses three questions: 1) Are business owners generally more or less financially conservative than their non-business-owning counterparts?; 2) Do business owners accumulate more wealth?; and, 3) Do business owners hold a smaller share of their financial assets in risky stock holdings? Results indicate that business owners are financially conservative based on borrowing and savings questions but are more likely to be willing to assume above-average risk for financial gain. Consistent with earlier evidence that entrepreneurs save more, business owners accumulate more wealth over time. Business owners and non-business owners invest similar shares of their financial portfolios in safe assets. Taken together, the results suggest that policies aimed at increasing business ownership should focus on helping households identify high-value business opportunities through transparent tax, legal, and regulatory systems. Efforts to reduce risk should focus on the business venture, such as full loss offsets, rather than focusing on reductions in other financial risks.

1. Introduction

Little is known about the asset holdings of households that own businesses. For instance, it is possible that these households hold relatively safe assets outside of their businesses to balance the relative riskiness of business income. Business owners might be relatively risk-loving compared to non-business owners, as is commonly assumed in studies of entrepreneurial households, and hold relatively risky assets in addition to their business holdings. Identifying how business owners differ in their asset holdings provides key information to policymakers on whether these households actively seek risk reductions by investing relatively heavily in safe assets, in which case risk might be acting as a deterrent for business ownership. If households that own businesses are investing more heavily in relatively safe assets, then policies that reduce financial risk (such as the availability of high-yield certificate of deposit accounts) might spur business ownership among high ability households with lower risk tolerances. Alternatively, business owners may not view their ventures as risky due to asymmetric information or perceptions of their projects. In this case, policies that facilitate the ability to assess the profitability of business ownership, such as a transparent patent process and systems of regulation and taxation, would be better suited for promoting growth in business ownership.

This paper addresses three main issues at the household-level. First, data on financial attitudes and savings behavior is used to gauge whether business owners are generally more or less financially conservative than their non-business-owning counterparts. Second, the paper examines asset holdings of business owners and non-business owners, and addresses whether entrepreneurs accumulate more wealth.

Given that previous research finds that entrepreneurs save at higher rates, one would expect that longer spells of entrepreneurial activity, often defined as owning a business, would lead to higher levels of wealth accumulation. Finally, an instrumental variables regression analysis is used to establish whether business owners hold a different share of their financial portfolio in relatively risky assets.

For the purpose of this analysis, “business owner” is defined as a household in which the head or spouse owns and actively manages a business. This measure avoids arbitrary asset or income thresholds but still allows comparisons to the findings from the most recent research on entrepreneurs and savings (Gentry and Hubbard, 2004). Self-reported responses to questions about working for oneself also are commonly used to proxy for entrepreneurship. A second measure for business ownership, defined as a household where the head or spouse reports working for him or herself, is used to test the robustness of the results.

The analysis uses 1989 to 2007 data from the Federal Reserve Board, Survey of Consumer Finances (SCF). The dataset is uniquely suited for making asset comparisons based on business ownership status as it contains detailed asset information, various proxies for business activity, and information on saving and risk attitudes. The SCF is conducted triennially and comparable datasets are available for seven surveys spanning nearly twenty years from 1989 to 2007. The survey is designed to collect extensive information on household wealth, including many asset and liability categories. The SCF generally is considered to be the highest-quality data for addressing household wealth and financial decisions (Curtin, Juster, and Morgan, 1989;

Pence, 2002). In addition, the SCF contains a rich set of control variables including demographic information.

The paper is organized into sections as follows. Section 2 reviews selected literature on portfolio composition and the asset holdings of business owners. Section 3 contains a description of the data, and the research methodology is presented in Section 4. Section 5 presents the results. Section 6 discusses policy implications of the research and provides directions for future research using SCF data.

2. Selected Literature

Recent literature related to the finances of entrepreneurs can be separated into three categories: 1) studies of asset holdings; 2) the effects of wealth on entrepreneurial entry; and, 3) studies of risk aversion and portfolio choice. Gentry and Hubbard (2004) examine savings patterns using 1983 and 1989 SCF data. The authors find that the portfolios of entrepreneurial households are undiversified, with most of their assets held within active businesses. Entrepreneurial households also are found to own a substantial share of wealth and have higher savings rates.

This research expands on the work of Gentry and Hubbard (2004) by using more recent data to establish whether the patterns they observed persist and using multivariate analysis to examine whether the higher savings rates observed in Gentry and Hubbard (2004) are apparent in higher levels of wealth accumulation for business owners. Like Gentry and Hubbard (2004), this research takes advantage of the fact that the SCF contains extensive information on assets and includes information on all business assets, including sole proprietorships and incorporated businesses.

Recent work suggests that many households owning small businesses accumulate wealth similarly to households not owning small businesses and also have risk preferences that are more similar than commonly assumed. Haynes (2010) finds that SCF households owning one small business accumulated wealth from the late 1990s to 2007 at rates similar to non-business-owning households. Households owning more than one small business accumulated wealth at a somewhat higher rate. Puri and Robinson (2009) use SCF data and find owners of family businesses have risk profiles similar to wage and salary workers, and that other business owners are somewhat more risk-loving. They find that business owners tend to be optimistic, but only to the extent that they are compelled to prudent financial habits.

One limitation of previous research is that the studies take entrepreneurial status or business ownership as given, implicitly assuming away problems of selection bias. This approach assumes that observed outcomes would be the same for business owners as non-business owners had they never started a business. In other words, there are no systematic differences in the expected outcomes of business owners and non-business owners. To assess the effect of being a business owner, defined in this case as owning and actively managing a business, the effects of ownership must be separated from any unobservable household or individual-level characteristics that affect both whether a household owns a business and their allocation of financial assets. To address this issue, business ownership is treated as endogenous and an instrumental-variables approach is used to identify the effects of being a business owner on the allocation of financial assets.

A closely related literature examines the effects of wealth on entrepreneurial entry. Early studies of wealth and entry found significant effects of wealth on entry into entrepreneurial activities (Evans and Jovanovic, 1989; Holtz-Eakin, Joulfaian, and Rosen, 1994a, 1994b, Fairlie 1999; Zissimopoulos, Karoly, and Gu, 2009). However, more recent work suggests that the wealth effects are limited to the very top of the wealth distribution (Hurst and Lusardi, 2004; Moore 2004b).

The final related literature examines risk preferences and portfolio choice. Although not focused on differences between households that own businesses and those that do not, the literature suggests that labor income risks (Guiso, Jappelli, and Terizzese, 1996; Davis and Willen, 2000) are important in determining portfolio allocations, where higher risk leads to less investment in risky assets. These findings potentially have implications for business owners who are commonly assumed to have higher levels of labor-related income risks in theoretical models of tax behavior and entrepreneurship (Bruce, 2000 and 2002; Cullen and Gordon, 2007).

Independent risks, including borrowing constraints (Guiso, Jappelli, and Terizzese, 1996) and medical expenditures (Goldman and Maestas, 2005), also have been found to play an important role in portfolio allocations. Again, it seems possible that households who own businesses differ in terms of these risks. Other factors affecting portfolio allocations include wealth and education (Bertaut, 1998; Calvet, Campbell, and Sodini, 2009). In terms of independent risks, evidence that business owners are systematically reducing their rate of return risk relative to non-business owners by holding larger shares of relatively safe assets would suggest that policies that reduce financial or other independent risks likely would lead to more business

ownership. Conversely, if shares of risky assets do not differ by business ownership, then the investing activity is driven by individual or household-level characteristics, and any policy interventions should be focused directly on the business venture.

The empirical methodology outlined below expands this literature by addressing whether business ownership leads to significant differences in portfolio allocations. More specifically, it examines whether business owners hold more or less of their financial portfolios in risky assets. Endogeneity of the business ownership decision is addressed using instrumental variables (IV) methods. Incorporating other factors found to be important in the literature allows for assessing the relative importance of risk factors such as health, wealth, and education.

3. Data

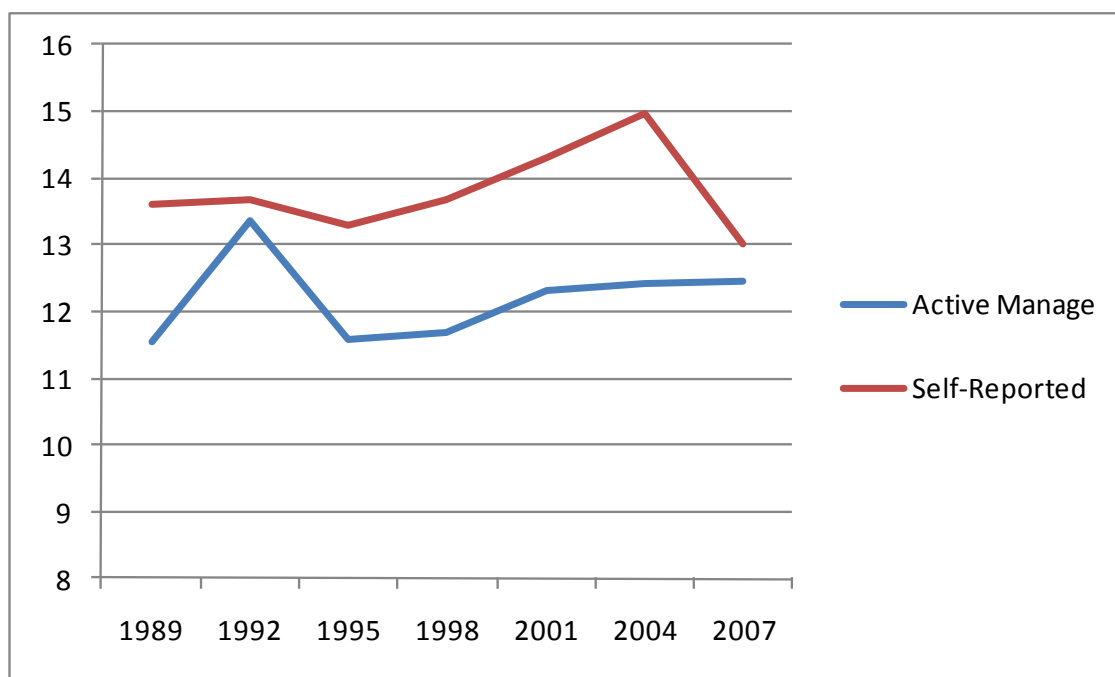
The SCF represents the highest quality wealth data for U.S. households. It is conducted every three years and includes approximately 4,500 households per year. The survey design has remained consistent since 1989, allowing for pooled data analysis from 1989 through 2007.¹ The data are particularly well-suited for this research because they contain detailed information about household asset holdings and allow for multiple measures of business activity. The data also are supported by detailed technical documents, are publicly available, easily downloadable in a usable format, and can be weighted to account for sampling error.

Several other features make the data ideal for this research. The data contain information about business ownership regardless of organizational form (an advantage over tax return data that do not include incorporated businesses). The data also include

¹ See Mach (2007) for more information on the SCF.

a rich set of additional control variables including age, education, marital status, race, income, and savings and risk attitudes.

Figure 1: Entrepreneurship Rates Over Time



Business Ownership Rates

Figure 1 includes business ownership rates over time using two different measures: 1) spouse or head owns and actively manages a business; 2) respondent reports that he/she or his/her spouse work for self.² Consistent with Gentry and Hubbard (2004), about 11.5 percent of respondents owned and actively managed a business in 1989. That number increased to about 12.5 percent in 2007 with a spike in 1992. Self-reported status of working for oneself was generally higher than those actively managing a business but dropped to 13 percent in 2007, one-half of a

² Population weights were used to generate all statistics. Slight differences are likely between the statistics presented in this analysis and those presented in Bucks et al. (2009) because this analysis is limited to the public-use version of the data.

percentage point above the actively managing a business rate. The analysis presented below is based on the first measure. Results are qualitatively the same for the self-reported measure.

Financial Attitudes and Experiences

The SCF contains multiple questions addressing financial attitudes and experiences including risk attitudes, savings tastes, stability of income perceptions, and recent loan activity. Weighted variable means are presented in Table 1. Business owners and non-business owners do not differ in their economic outlooks with over 38 percent expecting economic conditions to remain the same in the near future and roughly 30 percent expecting better or worse conditions.

Business owners are more likely to shop for the best investment or borrowing terms; 91 percent of business owners report shopping a moderate amount or more, while only 82 percent of non-business owners shop as much. In terms of borrowing practices, business owners appear slightly more conservative, with 47 percent reporting that it is OK to borrow for living expenses versus 52 percent for non-business owners. Business owners were more likely to report that it was acceptable to borrow for education expenses but the difference was not statistically significant.

Experiences with the loan process differed substantially amongst business owners and non-business owners. Business owners were far more likely to have applied for a loan in the past five years (84 percent versus 64 percent). Non-business owners were far more likely to be declined contingent on making an application (31 percent of non-business owners versus 23 percent of business owners). Business

owners also were less likely to report that they had not applied for a loan because they thought they would be turned down.

Retirement saving was important for 45 percent of business owners and 32 percent of non-business owners and, consistent with this motivation, business owners were more likely to identify a savings horizon of five or more years. The strong emphasis on long-term retirement savings is a bit surprising given that a recent study finds that small business owners have low participation rates in traditional retirement savings plans. Lichtenstein (2010) finds that less than 17 percent of owners with fewer than ten employees participate in a 401(k)/Thrift plan.

Consistent with assumptions in the literature, business owners were more likely to report being willing to take risks to achieve financial gain. Specifically, business owners were about twice as likely to agree that they would be willing to take “substantial (above average) financial risks expecting to earn substantial (above average) returns.” Taken together with the emphasis on retirement savings, these responses suggest that observed risk-taking behavior is a product of the tension between long-term savings goals and undertaking risk to achieve financial gain.

Business owners were slightly less likely to report liquidity (cash-on-hand, saving for emergencies, saving for illness, etc.) as one of the most important reasons for saving. Perhaps surprisingly, less than 4 percent of business owners reported saving for investments, including investments in their businesses, as a primary reason for saving.³ Business owners were substantially more likely to report that they could borrow \$3,000 from family or friends if needed, perhaps indicating a stronger financial safety net. As expected, business owners were less likely to report that they had a good idea

³ Respondents could report up to six reasons for saving.

of next year's income or that they usually have a good idea of their future income. However, the differences are not perhaps as large as one might assume, given that entrepreneurial ventures often are assumed to be risky, with larger variances in incomes. About 64 percent of business owners had a good idea of next year's income, and nearly 69 percent usually had a good idea of future income; the numbers for non-business owners were 69 percent and 73 percent, respectively. One possible explanation for this result is that business owners have a target income, and adjust their effort and hours accordingly.

4. Methodology

The first challenge in any study of entrepreneurship or business ownership is measuring the variable of interest. As noted above, business owners are defined as those households owning and actively managing a business (regardless of the market value of these assets). An alternative measure of self-reported working for oneself yields qualitatively similar results and is excluded for brevity.⁴

Asset Holdings

The assessment of asset holdings begins with simple descriptive statistics by business ownership status using population weights. Comparisons include population percentages by income and net worth category, income and asset levels, portfolio allocation in selected assets (e.g. liquid assets, bonds, business assets), and changes in asset allocations over the time period.

⁴ These results are available from the author upon request. The SCF allows for other possible variants of this definition including using the status of the primary earner, relative amount of time spent in the entrepreneurial activity, and relative earnings from the entrepreneurial activity. Exploration of alternative definitions is left to future work regarding household-level decision-making.

Wealth Accumulation

A multivariate analysis is used to establish whether the number of years as a business owner is correlated with increased levels of wealth. A positive coefficient on years of business ownership would be consistent with Gentry and Hubbard (2004), who found increased savings rates amongst entrepreneurs, which should in turn, lead to increased levels of wealth.

Median regressions of the following form are used to mitigate the effects of extreme values:

$$Y = \gamma * Years_{Bus} + \delta_{92} * yr_{92} + \delta_{95} * yr_{95} + \delta_{98} * yr_{98} + \delta_{01} * yr_{01} + \delta_{04} * yr_{04} + X\beta + \varepsilon$$

where Y represents net worth in hundreds of thousands of dollars.⁵ $Years_{Bus}$ represents the number of years in the current business activity. A series of dummy variables is included for survey year, and X represents a set of household-level control variables. As wealth is likely to depend on a number of demographic characteristics, X includes indicators for income, education, and age category. Wealth is expected to increase with increases in each of these factors, at least until retirement age. Controls also are included for marital status, race, and number of children. Poor health is likely to have a negative impact on wealth accumulations, and a dummy variable for self-reported poor health is included. An indicator for pension is included as the presence of a pension might lead a household to accumulate fewer assets in anticipation of retirement. Analogously, a dummy variable for health insurance coverage is included as coverage might lead to less saving for unexpected health expenditures, reducing wealth. An indicator for receipt of an inheritance is included and expected to be

⁵ Estimating net worth or wealth from SCF public-use data is a complicated task. To ensure accuracy and for comparability with data published in the *Federal Reserve Bulletin*, SAS code provided on the SCF Web site was used to generate all asset and wealth variables.

associated with higher levels of wealth. An indicator for home ownership is included as many households hold a substantial portion of their wealth in their primary residence.

An additional specification adds savings and risk variables, akin to Pence (2002) and Bertaut (1996). A series of dummy variables is included for whether the household reports a short (few months to one year), medium (more than one to ten years), or long savings horizon (more than ten years). Dummy variables also are included for the three most commonly cited reasons for saving: retirement, children's education, and emergencies. Responses to a question addressing willingness to assume risks for financial gain are used to create dummy variables for "substantial", "above average", "average", or "no risk". Savings taste and risk variables are used to at least partially address the concern outlined in Gentry and Hubbard (2004) that ability is correlated with wealth (and thus, entrepreneurs have higher savings rates, and consequently wealth, as they expect higher returns on active business assets than financial assets and increase their savings levels to finance increased business investment).

To be sure, the above specification faces several methodological hurdles. As mentioned above, there is disagreement in the academic literature about the effects of wealth on entry into a business activity. If, as the most recent literature suggests, there is little relationship for the vast majority of households, then reverse causation concerns regarding the business ownership variable are lessened. In any case, the results are best viewed as descriptive, providing suggestive evidence that is either consistent or inconsistent with the finding that business owners save at higher rates than their non-business owning counterparts.

Elements of the SCF design pose a couple of issues for estimating the above equation and the investment in risky asset regressions described below. First, the survey is based partially on a random sample of households and partially (about 30 percent of respondents) on an oversample of high wealth households. This dual sampling approach is utilized to capture an accurate portrait of wealth holdings (highly concentrated in relatively few households) while also getting responses from representative households throughout the wealth distribution. Due to this dual sampling approach, weights are necessary to ensure that the data are representative of the population.⁶

The other closely related issues are imputation and replicates. Missing values in the SCF data are imputed using a model designed for the SCF (Kennickell, 2000). To address possible imputation error, the model generates five replicates for each respondent, called implicates. Each of the regressions presented below is estimated using all five implicates, and standard errors used in significance testing are adjusted according to Kennickell (2000). The starting year is selected as 1989 as surveys from that point on have a consistent design.

Investment in Risky Assets

The question of how business owners invest their financial assets poses some concerns from an estimation perspective. Factors that affect the business ownership decision, such as innate ability, and risk attitudes, are also likely to affect allocations of assets. In order to assess whether business owners invest in “safe” assets to offset

⁶ Note that weighting is not necessary in a regression context if all factors used in the sample design are included as control variables. However, the SCF cannot publish details of its sampling methodology due to confidentiality concerns making it difficult to know whether this condition has been met.

business income risks, this endogeneity problem must be addressed. In the analysis below, an instrumental variables (IV) approach is used to accomplish this task.⁷ The share of the financial portfolio invested in risky assets is estimated as a function of business ownership and a set of control variables where ownership is estimated in a first-stage regression.

The variable of interest, *Owner*, takes a value of one if the household meets the definition of business owner outlined above and zero otherwise. The selected IV(s) must be highly correlated with owning a business but not with the unobservable factors that affect risky portfolio allocation. The IVs selected for this research represent lending conditions and general attitudes about business ownership. The annual “bank prime loan” rate from the Federal Reserve Statistical Release is used to proxy for the general cost of borrowing to start a business. The general attitude toward business ownership is measured using data from the Cooperative Institutional Research Program (CIRP) survey of incoming college freshman. Incoming freshman from 500 to 700 schools answer a question about their “probable occupation”. The percent selecting “business owner or proprietor” is used as an indicator of the general attitude toward business ownership among young adults in each year.

Several authors have noted that people are most likely to become “entrepreneurial”, defined as forming a new business enterprise or starting a business, after they have been out of college or in the workforce for more than ten years (Pryor

⁷ One way to address the limitation of having cross-sectional, not panel data, is to treat the surveys as repeated cross-sections following recent SCF research (Sabelhaus and Pence 1999; Moore, 2004). However, repeated cross-section estimation is a version of instrumental variables (IV) estimation (Moffitt, 1993) and requires that all of the standard IV conditions are met (Verbeek and Vella, 2005). Common groupings, such as age cohorts, are not an option for this analysis as the entrepreneurial decision is commonly associated age and other potential grouping variables.

and Reedy, 2009; Stangler, 2009; Reynolds and Curtin, 2008). Data from the Kauffman Firm Survey, a longitudinal survey of new firms indicate that men had about thirteen years of experience and women had around nine years of experience prior to forming their new venture (Robb and Coleman, 2009). Results from the U.S. Census, Characteristics of Business Owners show that the most common level of prior experience (accounting for about 30 percent of business owners) is ten to nineteen years (Fairlie and Robb, 2007). Based on these results, a ten-year span from expected college graduation (age twenty-two) is used to measure the instrumentation variables in the baseline results. The lower end of estimates is used to capture conditions when the business ownership decision is first likely to be seriously contemplated. Results using the higher experience estimates, assuming a thirteen-year span from expected graduation, are nearly identical to those reported below.

Risky assets are defined as direct and indirect holdings of publicly traded stock. This is similar to Calvet, Campbell, and Sodini (2009) who define risky assets as stocks and risky mutual funds in their analysis of Swedish households, and Ji (2004) who defines stocks as risky assets compared to risk-free checking and savings accounts.

Control variables include basic demographic information in addition to variables selected based on results from the prior literature. In addition to age, a married indicator is included, as differences in asset allocations have been found based on marital status (Sundén and Surette, 1998; Jianakoplos and Bernasek, 1998; Bertaut, 1998). Other factors affecting portfolio allocations include wealth and education (Bertaut, 1998; Calvet, Campbell, and Sodini, 2009). Interestingly, within liquid assets, the share invested in risky assets is not affected by *changes* in wealth (Brunnermeier and Nagel,

2008); so it is the level, not growth in wealth that is expected to affect risky asset holdings.

Research also suggests that poor health increases financial strain and a self-reported measure of poor health is included (Lyons and Yilmazer, 2005). Concerns about reverse causation of the health variable are somewhat mitigated as there is little evidence that financial strain affects poor health (Lyons and Yimazer, 2005). Home ownership has been found to affect stock diversification (Ji, 2004). Given these results, controls for education, wealth, home ownership, and health status are included in the regression. As in Guiso, Jappelli, and Terlizzese (1996), a variable is included for whether the household has any pension plan. Presence of an inheritance also is included given the importance of inheritances in the liquidity constraints literature (Hurst and Lusardi, 2004).

Liquidity constraints have been found to reduce the holdings of risky assets (Guiso, Jappelli, and Terlizzese, 1996; Ji, 2004). A control for liquidity constraints is constructed using SCF responses to expected savings questions. Specifically, respondents report whether “liquidity” is an important saving motivation for their household. As in the wealth estimations above, a separate specification is estimated using proxies for savings and risk attitudes.⁸

Means of the regression variables are included in Appendix Table 1. Weighting to the full population, 15.8 percent and 17.2 percent of households are business owners based on measures 1 (head or spouse own and actively manage a business) and 2

⁸ Other candidates for control variables, such as income, health insurance status, and perceived labor income risk are excluded from the baseline specification as they are likely to be jointly determined with the covariate of interest, business ownership. Results remain the same when these variables are included.

(head or spouse report working for self), respectively. The percent of business owners more than doubles when the data are not weighted (based on one randomly chosen implicate). The mean share of financial assets allocated to risky assets is also larger (34.8 percent versus 28.8 percent) in the unweighted data. These results are consistent with the SCF sampling methodology, which oversamples high-wealth households.

Consistent with the findings of previous research, business owners are older, more likely to be married, more likely to be white, and more likely to be willing to take substantial, or above average risk for financial gain than non-business owners. Business owners were more likely to report a long savings horizon and report retirement as a main motivation for saving, consistent with recent findings that entrepreneurs tend to be financially conservative (Puri and Robinson, 2009). Although the difference is statistically significant at the 5 percent level, the difference in reported labor income risk between non-business owners (0.225) and business owners (0.253) is not as large as conventional wisdom might predict.

The mean of share of risky financial assets was also higher for business owners (45.4 percent versus 29.7 percent). However, these mean values mask the fact that there are many households with zeroes, and the median value for non-business owners in the pooled sample is zero (the median for households owning businesses is 14.0 percent). In some specifications, a tobit model is used to account for the high frequency of zeroes in the dependent variable.

5. Results

The results are organized into summary statistics of assets, wealth, and portfolio holdings, median regression results for wealth holdings, and regressions of the propensity to hold risky assets.

Assets, Wealth, and Portfolio Allocation

Table 2 contains business owners' share of the population by income and wealth categories based on weighted 2007 SCF data and using the categories reported in Bucks et al. (2009). Overall, 12.26 percent of households own businesses. Business owners are underrepresented in the lower income categories, making up about 3 percent and 5 percent of the lowest and second-lowest income quintiles, respectively. At the upper end of the income distribution, business owners account for 18 percent of households in the 80th to 90th percentile range and 37 percent of households in the 90th to 100th percentile range. The pattern is even more exaggerated for wealth categories as business owners comprise 2 percent of the lowest quarter of the wealth distribution and 43 percent of households in the 90th to 100th wealth percentile range. These results are consistent with Gentry and Hubbard (2004) who report that entrepreneurs account for 11.5 percent of the population in 1989 using the same definition. Using a more restrictive definition, (entrepreneurs must have at least \$5,000 in active business assets) Gentry and Hubbard (2004) find a similar pattern, with business owners holding disproportionate amounts of assets and net worth.

Table 3 provides more detailed information about income, asset, and net worth levels. Business owners have higher mean and median income levels. The median

income for business owners is \$87,000, whereas the median for households not owning businesses is \$42,000. Likewise, business owners have more assets and net worth overall and by income category. Business owners have a median net worth of \$497,000, and non-business owners have a median net worth of \$94,000. The difference is large but the ratio of median net worth for business owners to median net worth for non-business owners of 5.29 is lower than the 8.03 ratio calculated from Gentry and Hubbard (2004) using 1989 SCF data. Statistics presented in Table 3 reveal that there are business owners in the lowest income group with substantial net worth as median wealth for this group is higher than the median for those in the next income quintile.

Table 4 contains portfolio shares for selected assets and medians conditional on having a non-zero value for the asset for 1989, 1998, and 2007. Note that while the patterns are generally consistent with Gentry and Hubbard (2004) the numbers differ because assets are defined differently. Assets for this analysis are defined as in Bucks et al. (2009). Business owners have higher median values of financial assets, liquid assets, and direct stock holdings, although the portfolio share of these assets is smaller for business owners who also hold considerable active business assets. Conditional on holding the asset, non-business owners had a higher median for CDs and bonds in 2007, although the value was higher for business owners in 1989. Conditional on having passive business holdings, business owners and non-business owners held the same shares of their portfolios in passive business assets, but because business owners have higher levels of net worth, the median dollar amount invested was more than double for business owners (\$263,000) than non-business owners (\$100,000). This finding is

consistent with the notion that angel investors, high-net-worth individuals who invest passively in growing companies, are likely to be business owners. More research is needed to identify whether business owners make angel investments at higher rates because they own active business assets or because they have higher levels of wealth than non-business owners.

Years of Business Ownership and Wealth Accumulation

Median regression results for wealth in 1989, 1998, 2007, and all years are presented in Table 5. Results are consistent with the finding in Gentry and Hubbard (2004) that business owners save at higher rates than non-business owners, but further research is needed to establish a causal link between business ownership and wealth. Each additional year of business ownership is associated with a \$2,700–\$3,000 increase in net worth. Other factors correlated with increased wealth are the presence of an inheritance, home ownership, more education, increased age, and increased income. Poor health is associated with reduced wealth. Similar results were obtained using OLS regressions instead of median regressions.

Adding savings and risk proxies does little to affect the coefficient on business ownership (Table 7) although each of the savings and risk factors was statistically significant. Longer savings horizons, including saving for retirement, were associated with higher levels of wealth, while saving for a child's education or an emergency were associated with lower levels of wealth. Willingness to take some risk also is associated with higher levels of wealth, with the largest effect from taking above average risks.

Entrepreneurs and Risky Financial Investment Shares

Regression results for the share of a household's portfolio allocated to risky assets are presented in Table 6. Column 1 includes results from a tobit model with population weights. Owning and actively managing a business is associated with a 3.0 percentage point (19 percent) decrease in holdings of risky assets. In the unweighted specification (column 2) the coefficient is much smaller, and the null of a zero coefficient cannot be rejected. However, these specifications suffer from potentially large endogeneity problems as unobservable factors that affect one's occupation choice are also likely to affect the allocation of risky assets. If business owners offset business income risk by investing in fewer risky assets and are relatively risk-loving when it comes to financial decisions, as is commonly assumed, then the coefficient is biased toward a zero or positive coefficient, and the estimate should be viewed as a lower-bound. However, if business owners offset business income risk by investing in fewer risky assets and they are financially conservative, as recent research suggests, the coefficient is biased downward and the statistically significant negative coefficient could be a result of selection bias.

To investigate the true effect of being a business owner on risky asset holdings, the last three columns present results from instrumental variables (IV) models. The two instrumental variables included in the first-stage are the "prime" bank interest rate and a measure of general attitudes toward business ownership when the head of the household was thirty-two years of age. This age was chosen because researchers have found that individuals are most likely to start a business at least ten years after completing college or being employed. Interest rates are negatively correlated with

becoming a business owner, and favorable attitudes toward owning a business are positively correlated with ownership. Both IVs are expected to be uncorrelated with household-specific unobservables that affect future risky asset holdings. As discussed below, testing confirms the appropriateness of the IVs.

Column 3 includes results from a weighted IV tobit model. As in the unweighted tobit, the coefficient on business ownership is negative, but the null of a zero coefficient is not rejected for this model. Columns 4 and 5 include the preferred results for the analysis as they are adjusted for the presence of multiple implicates in the SCF data. These results are from second-stage IV regressions (unweighted tobit and unweighted linear models) using the above described IVs.⁹ In both cases, the coefficient on business ownership is positive, and the null of a zero coefficient is not rejected. All of the IV results lend support to the idea that failure to account for selection biases the coefficient downward. Not accounting for selection bias leads to an erroneous conclusion that business owners hedge their business income risks by investing fewer of their financial assets in risky stocks.

Several tests of the appropriateness of the IVs and the robustness of the results are included. Finlay and Magnusson (2009) developed a series of inference tests that are robust to weak instruments for the IV Tobit model in Stata. These tests include the Anderson-Rubin (AR) statistic, the Kleibergen-Moreira Lagrange multiplier (LM) test, the overidentification (J) test, and the conditional likelihood ratio (CLR) test. The LM and J tests are combined to account for the spurious decline in power of the LM test in some regions of the parameter space, and Stata reports whether the null for the combined test is rejected or not rejected at the 5 percent level (Anderson and Rubin, 1949;

⁹ First-stage results are available from the author upon request.

Moreira, 2003; Kleibergen, 2007). The null-hypothesis for all of the tests is that $\beta_{\text{Owner}} = 0$. Test statistics are reported in Table 6 and indicate that the null of a zero coefficient is not rejected at the 5 percent level for any of the tests.

Additional tests are available for linear regression IV models (Baum, Schaffer, and Stillman, 2007). The underidentification LM statistic tests the null that the matrix of reduced form coefficients is underidentified (has rank= $K-1$) against the alternative hypothesis that the matrix is identified (has rank= K). The null hypothesis is rejected at the 1 percent level.

The Cragg-Donald statistic (Wald F) tests the null that the equation is weakly identified. The estimated C-D statistic of 26.95 is greater than 19.93, the critical value for 10 percent maximal IV size (S-Y 10%) estimated by Stock and Yogo (2002). Finally, the Hansen J statistic tests the joint null hypothesis that the instruments are valid (uncorrelated with the error terms and appropriately excluded from the second-stage equation). The null of valid instruments is not rejected at standard levels of significance (rejected only at the 30 percent level).

Results for other variables included in the specification indicate that older individuals are less likely to invest more of their financial portfolios in risky assets, relative to the baseline age group of thirty-two to thirty-five years old. Households that have received an inheritance, have more education, or identify themselves as white are more likely to invest in risky assets. Those with more children, worse health, less education, and those who save for liquidity reasons are less likely to invest in risky assets.

A common definition of entrepreneurship in the previous literature is a self-reported response to a question regarding whether the person works for themselves or from someone else. Results from regressions using this alternative measure of business activity yield qualitatively identical results.

The SCF provides the opportunity to include controls for savings and risk attitudes. These results are included in the second column of Table 7. Those with longer saving horizons (medium and long versus short or saving for retirement) and higher risk tolerances (average, above average, or substantial versus none) are more likely to invest larger portions of their financial portfolios in risky assets. Inclusion of these variables results in a slightly smaller coefficient on business ownership but the null of a zero coefficient is, once again, not rejected. Risk and saving attitudes are prime candidates for unobservable factors that might affect business ownership and financial asset allocations. That the inclusion of these variables has little effect on the results for business ownership further suggests that the IVs are valid.

Conclusions, Policy Implications, and Future Research

Taken as a whole, the evidence presented above provides interesting insights to important policy questions. Evidence on financial attitudes indicates that business owners generally are conservative when it comes to saving and spending, and allocate more time to shopping for financial products. They are less likely to report that it is OK to borrow to cover living expenses, more likely to say it is OK to borrow for education purposes, and are much more likely to report that they are saving for longer time horizons. This is consistent with findings from the earlier literature that business owners

have higher savings rates (Gentry and Hubbard, 2004) and with the analysis above, which finds that more years of business ownership are correlated with higher levels of wealth.

The idea that business owners are financially conservative is at odds with the conventional view of entrepreneurs, often defined as business owners, as risk-takers. Also, responses seem to suggest that business owners do not consider their business income to be as unsure as previously thought. In the SCF, 69 percent of business owners compared to 73 percent of non-business owners report that they usually have a good idea of their expected income. Business owners also might have more of a financial safety net from family and friends; 82 percent of business owners, versus 64 percent of non-business owners, report that they would be able to borrow \$3,000 from family or friends if needed. However, consistent with the conventional wisdom, business owners report that they are more willing to accept average or more risk to receive a higher return.

The key question addressed in this research is whether observed differences in asset holdings are products of owning and actively managing a business, or whether these differences are attributable to household or individual-level characteristics. Specifically, this research addresses whether business owners who actively manage their businesses hedge the perceived business income risk by investing smaller shares of their financial portfolios in risky assets. Although it is clear that selection bias, where unobservable factors affect both whether a household owns a business and its preferences for risky assets, is a potential problem, the direction of the bias is unclear *ex ante*.

Interestingly, after controlling for selection bias, business owners are no less likely to invest in risky financial assets, suggesting that they might view their business ventures as less risky than commonly assumed. This tension between risk and return provides an opportunity for policy intervention. Policies aimed at increasing business ownership should focus on the business activity rather than reducing other risks (e.g., increasing the availability of high-yield, low-risk financial assets). Policies might include loss offsets for business income, easier access to information on profitability, and transparency in tax, regulation, and intellectual property policies.

This research represents a small portion of the policy-relevant information that can be gleaned from the SCF. Other extensions could include examining labor allocation decisions, such as the “degree” of entrepreneurship (measured in time or earnings) or the decision of the secondary earner to enter a business activity. Women business owners represent a sub-group that is not particularly well-understood, and the SCF could be used to address factors that affect their business ownership decisions. Developing a panel component to the data, whether by constructing variables from employment history questions or linking the SCF to a panel dataset (such as tax return data), would allow an assessment of asset holdings on business entry and exit decisions.

Table 1: Financial Attitudes and Experiences by Business Ownership Status

	Non-Owner	Business Owner
Future Economic Outlook		
Better	31.12	30.12
Worse	30.84	31.10
Same	38.03	38.77
Financial Shopping		
Moderate or More	82.05	90.45
Okay to Borrow for Living Expenses		
Yes	52.27	46.51
Okay to Borrow for Education Expenses		
Yes	82.43	85.03
Loan Application in the Last Year		
Yes	63.82	83.64
Loan Application Outcome		
Declined	19.69	19.51
Approved	44.13	64.13
Did Not Apply for Loan because Expected to be Declined		
Yes	15.95	10.68
Reason for Saving: Liquidity Purposes		
	32.37	29.65
Reason for Saving: Investment		
	1.49	3.55
Reason for Saving: Retirement		
	32.32	45.37
Saving Horizon		
Few Months	22.90	15.02
Next Year	12.97	7.26
Few Years	27.10	26.63
5-10 Years	23.83	33.13
More than 10 Years	13.20	17.96
Willing to Take Risk for Financial Gain		
Substantial	3.00	6.03
Above Average	15.14	28.11
Average	37.05	45.24
No Risks	44.82	20.62
Could borrow \$3000 from Family or Friends		
Yes	64.36	81.71
Have a good idea of next year's income		
Yes	69.29	63.51
Usually have a good idea of income		
Yes	73.38	68.58

Source: Author's calculations based on 4,418 respondents from the 2007 SCF. The calculations use population weights. All differences except future outlook and saving for education are statistically significant at the 5 percent level based on t-tests of the weighted data including imputates.

Table 2: Business Owners' Share of Population, Income, and Net Worth

Overall	12.46
Income Percentiles	
0-20	3.38
20-40	4.79
40-60	10.31
60-80	16.63
80-90	17.56
90-100	36.79
Net Worth Percentiles	
0-25	2.17
25-50	7.26
50-75	12.48
75-90	17.75
90-100	43.2

Source: Author's calculations based on 4,418 observations from the 2007 SCF. The calculations use population weights. Income and net worth categories are the same as those presented in Bucks et al. (2009).

Table 3: Income, Assets, and Net Worth by Ownership Status

	All		Non-Owners		Business Owners	
	Mean	Median	Mean	Median	Mean	Median
Income	84.14	47.31	67.69	42.16	199.73	87.41
Assets	652.51	213.20	424.45	180.07	2,254.87	650.12
Net Worth	555.44	120.43	343.95	94.30	2,041.39	497.00
Net Worth by Income Category:						
0-20	105.86	8.79	73.06	7.50	1,042.94	178.30
20-40	134.42	37.80	150.31	74.95	348.74	126.80
40-60	210.36	88.40	183.13	78.90	447.27	197.40
60-80	371.99	202.90	345.11	174.86	506.73	343.90
80-90	611.74	357.50	524.98	332.23	1,018.99	566.85
90-100	3,296.19	1,120.10	2,052.18	727.80	5,433.70	2,459.50

Source: Author's calculations based on 4,418 respondents from the 2007 SCF. The calculations use population weights. Income categories are the same as those presented in Bucks et al. (2009). Dollar amounts are in thousands of 2007 dollars.

Table 4: Selected Portfolio Shares by Business Ownership

	All		Non-Owners		Business Owners	
	Condition al Median	Portfolio Share	Conditional Median	Portfolio Share	Conditional Median	Portfolio Share
Financial Assets						
1989	11600	20.58	10100	22.71	25070	12.82
1998	22500	27.99	19300	29.34	51090	17.08
2007	28550	20.94	24700	22.55	76980	12.74
Liquid Accounts						
1989	2100	3.51	2000	4.02	5000	1.96
1998	3020	3.15	2800	3.42	6000	1.83
2007	4020	2.33	3500	2.45	11200	1.62
CDs and Bonds						
1989	5000	4.13	5000	4.72	7000	1.77
1998	5000	2.68	5000	3.06	5000	1.17
2007	7500	1.93	7600	2.42	6000	0.72
Direct Stock Holdings						
1989	8000	3.65	7000	4.42	10000	1.87
1998	18000	5.67	15000	5.95	38000	4.13
2007	17000	3.26	15000	3.62	30000	2.46
Direct and Indirect Stock Holdings						
1989	9000	5.86	8000	6.45	13000	3.46
1998	25000	14.73	22300	15.44	46800	11
2007	35000	10.36	30000	10.58	77750	8.43
Business Assets						
1989	70000	29.77	20000	9.96	82900	33.57
1998	60000	22.86	50000	11.03	60000	23.32
2007	80000	23.6	100000	7.01	102000	21.41
Active Business Assets						
1989	81000	32.37	N/A	N/A	81000	32.37
1998	60000	23.17	N/A	N/A	60000	23.17
2007	100000	20.67	N/A	N/A	100000	20.67
Passive Business Assets						
1989	30000	8.49	20000	9.97	100000	7.6
1998	60000	5.85	50000	11.03	70000	2.44
2007	118000	7.01	100000	7.01	263000	7.01

Source: Author's calculations based on 4,418 observations from the 2007 SCF. The calculations use population weights. Dollar amounts are nominal.

Table 5: Median Regressions of Wealth

	2007	1998	1989	Pooled
Years as Business	0.028 ***	0.030 ***	0.030 ***	0.027 ***
Owner	(0.002)	(0.002)	(0.001)	(0.001)
Married	0.024	0.049	0.021	0.026 **
	(0.031)	(0.026)	(0.019)	(0.011)
White	0.043	0.030	0.052 **	0.039 ***
	(0.030)	(0.027)	(0.022)	(0.011)
Children	0.010	-0.022	0.000	-0.007
	(0.012)	(0.010)	(0.008)	(0.004)
Bad Health	-0.138 ***	-0.080 ***	-0.064 ***	-0.100 ***
	(0.028)	(0.026)	(0.020)	(0.011)
Pension	0.038	0.012	-0.028 *	-0.007
	(0.028)	(0.024)	(0.018)	(0.012)
Inheritance	0.193 ***	0.140 ***	0.104 ***	0.150 ***
	(0.027)	(0.023)	(0.023)	(0.010)
Home Owner	0.662 ***	0.457 ***	0.401 ***	0.490 ***
	(0.036)	(0.027)	(0.023)	(0.011)
Less than HS	-0.054	-0.115 ***	-0.110 ***	-0.127 ***
	(0.043)	(0.034)	(0.025)	(0.015)
Some College	0.015 ***	0.027	0.005 ***	0.031 **
	(0.037)	(0.032)	(0.023)	(0.030)
College Degree	0.165	0.122 **	0.071	0.142 ***
	(0.036)	(0.028)	(0.021)	(0.013)
35-44	0.085 **	0.115 **	0.049 **	0.074 ***
	(0.039)	(0.032)	(0.024)	(0.013)
45-54	0.267 ***	0.208 ***	0.204 ***	0.217 ***
	(0.042)	(0.033)	(0.028)	(0.014)
Age Category 55-64	0.502 ***	0.386 ***	0.322 ***	0.457 ***
	(0.045)	(0.050)	(0.030)	(0.018)
65-74	0.716 ***	0.596 ***	0.323 ***	0.566 ***
	(0.051)	(0.047)	(0.031)	(0.020)
75+	0.860 ***	0.598 ***	0.461 ***	0.662 ***
	(0.057)	(0.051)	(0.038)	(0.020)
20-40	0.768 *	0.076	0.093 ***	0.098 ***
	(0.042)	(0.041)	(0.027)	(0.017)
40-60	0.195 ***	0.121 ***	0.148 ***	0.188 ***
	(0.047)	(0.039)	(0.033)	(0.017)
Income Percentile 60-80	0.572 ***	0.350 ***	0.227 ***	0.402 ***
	(0.058)	(0.044)	(0.032)	(0.019)
80-90	1.025 ***	0.737 ***	0.554 ***	0.793 ***
	(0.063)	(0.056)	(0.089)	(0.023)
90-100	1.924 ***	1.380 ***	1.420 ***	1.600 ***
	(0.062)	(0.059)	(0.088)	(0.025)
Constant	-0.212 ***	-0.143 **	-0.139 ***	-0.306 ***
	(0.047)	(0.040)	(0.028)	(0.023)
Pseudo R2	0.442	0.386	0.403	0.398
Observations	22090	21525	15715	145160

*Notes: Entries are from median regressions. The dependent variable is net worth in hundreds of thousands of dollars. Standard errors are in parentheses and have been adjusted to account for replicates in the data. All regressions are based on population weights. Pooled regression includes year controls. *** denotes significance at the 1 percent level, ** denotes significance at the 5 percent level, and * denotes significance at the 10 percent level.*

Table 6: Regressions - Share of the Financial Portfolio Allocated to Risky Assets

	Tobit Weighted	Tobit Unweighted	IV Tobit Weighted	IV Tobit Unweighted	IV Linear Reg Unweighted	
Variables						
Business Owner	-0.030 ***	-0.009	-0.064	0.070	0.006	
36-40	-0.013	0.013	-0.012	0.010	0.006	
41-45	-0.029 ***	0.004	-0.029 ***	0.001	-0.003	
Age Category						
46-50	-0.067 ***	-0.022	-0.067 ***	-0.024	-0.017	
51-55	-0.086 ***	-0.041 **	-0.086 ***	-0.043 **	-0.029 **	
56-60	-0.119 ***	-0.049 **	-0.112 ***	-0.049 ***	-0.032 **	
61 or More	-0.174 ***	-0.086 ***	-0.176 ***	-0.085 ***	-0.059 ***	
Married	0.033 ***	0.037 ***	0.035	0.032	0.013	
White	0.106 ***	0.102 ***	0.107 ***	0.099 ***	0.050 ***	
Children	-0.024 ***	-0.017 ***	-0.024 ***	-0.017 ***	-0.008 ***	
Net Worth (100,000)	0.127 ***	0.063 ***	0.132 **	0.053	0.042	
Bad Health	-0.107 ***	-0.089 ***	-0.108 ***	-0.088 ***	-0.039 ***	
Pension	0.384 ***	0.277 ***	0.379 ***	0.287	0.151 ***	
Inheritance	0.025 ***	0.038 ***	0.026 ***	0.036 ***	0.024 ***	
Home Owner	0.094 ***	0.130 ***	0.093 ***	0.130 ***	0.048 ***	
Liquidity	-0.004	-0.037 ***	-0.002	-0.041 *	-0.028 *	
Less than HS	-0.160 ***	-0.189 ***	-0.161 ***	-0.186 ***	-0.045 ***	
Some College	0.049 ***	0.046 ***	0.050 ***	0.045 **	0.019 *	
College Degree	0.049 ***	0.142 ***	0.107 ***	0.142 ***	0.091 ***	
Constant	-0.356 ***	-0.267 ***	-0.355 ***	-0.268 ***	0.079 ***	
Observations	50689	50689	50689	50689	50689	
Pseudo R2	0.2931	0.3126				
Specification Tests						
			CLR	0.21	LM	53.82 ***
			AR	2.38	Wald F	26.95
			LM-J	not rejected	S-Y 10%	19.93
					Hansen J	1.11

*Notes: For unweighted specifications, standard errors and coefficients have been adjusted for multiple implicates. All specifications include year controls. The sample includes years 1998 to 2007 and individuals aged 32 or greater. *** denotes significance at the 1 percent level, ** denotes significance at the 5 percent level, and * denotes significance at the 10 percent level.*

Table 7: Savings and Risk Variable Results

	Wealth	Portfolio Allocation IV Tobit
	Coeff.	Coeff.
Yrs. as Business Owner	0.026 ***	
Entrepreneur		0.059
Medium Horizon	0.064 ***	0.027 **
Long Horizon	0.106 ***	0.048 ***
Save for Retirement	0.051 ***	0.086 ***
Save for Child's Edu	-0.016 ***	0.014
Save for Emergency	-0.026 ***	0.007
Risk: Substantial	0.140 ***	0.304 ***
Risk: Above Avg	0.153 ***	0.325 ***
Risk: Average	0.129 ***	0.230 ***
Observations	145160	50689

*Notes: Entries are coefficients from a median regression for the wealth analysis and an IV Tobit regression for the portfolio allocation to risky assets. Sample sizes differ because the wealth regression includes all years and the portfolio allocation regression excludes 1989 and 1992 due to limited availability of the historical IVs. All regressions include year controls in addition to the full set of controls in Table 6. Coefficients and standard errors were adjusted to account for multiple implicates in the IV Tobit regression. Full results are available from the author upon request. *** denotes significance at the 1 percent level, ** denotes significance at the 5 percent level, and * denotes significance at the 10 percent level.*

Appendix Table 1: Means of Regression Variables by Business Ownership

		Weighted	Unweighted	Non-Owner	Business Owner
Risky Share		0.288	0.348	0.297	0.454
Business Owner		0.158	0.322	0.000	1.000
Work for Self		0.172	0.331	0.089	0.842
	36-40	0.189	0.168	0.187	0.127
	41-45	0.204	0.204	0.207	0.190
Age Category	46-50	0.197	0.211	0.202	0.229
	51-55	0.162	0.188	0.166	0.233
	56-60	0.093	0.110	0.093	0.146
	More than 60	0.023	0.203	0.021	0.028
Married		0.641	0.707	0.630	0.869
White		0.721	0.775	0.714	0.904
Children		1.140	1.210	1.151	1.336
Net Worth (hundred thousands)		1.172	2.136	1.291	3.916
Bad Health		0.256	0.214	0.258	0.120
Pension		0.632	0.610	0.629	0.568
Inheritance		0.289	0.332	0.279	0.442
Home Owner		0.718	0.752	0.672	0.921
Liquidity		0.310	0.251	0.298	0.152
Less than HS		0.108	0.086	0.114	0.028
Some College		0.189	0.161	0.175	0.131
College Degree		0.395	0.513	0.425	0.697
Saving Horizon	Medium	0.526	0.526	0.520	0.539
	Long	0.180	0.232	0.191	0.319
	Retire	0.540	0.563	0.532	0.629
Saving Reason	Child's Edu	0.170	0.166	0.167	0.166
	Emergency	0.326	0.317	0.318	0.315
	Substantial	0.045	0.060	0.045	0.091
Risk Tolerance	Above Avg	0.206	0.256	0.205	0.364
	Average	0.405	0.416	0.400	0.451
Income (thousands)		1.552	2.212	1.700	3.290
Health Insurance		0.794	0.836	0.798	0.916
Labor Risk		0.227	0.234	0.225	0.253
Prime Rate at Age 32		9.253	9.489	9.304	9.879
Business Attitude at Age 32		2.671	2.642	2.651	2.622
Observations		50,689	10,155	6,884	3,271

Source: Author's calculations based on data from the 1998 to 2007 SCF. Weighted statistics are based on all five implicates. Unweighted totals are based on one randomly chosen implicate. Dollar amounts in 2008 dollars. Statistics are based on the regression sample, which includes those who are aged 32 or greater.

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