

Are Male and Female Entrepreneurs Really That Different?

by

**Erin Kepler & Scott Shane
Shaker Heights, OH 44122**

for



under contract number SBAHQ-06-M-0480

Release Date: September 2007

The statements, findings, conclusions, and recommendations found in this study are those of the authors and do not necessarily reflect the views of the Office of Advocacy, the United States Small Business Administration, or the United States government.

Are Male and Female Entrepreneurs Really That Different?

An Office of Advocacy Working Paper by Erin Kepler and Scott Shane,
Shaker Heights, OH [61] pages. Under contract number SBAHQ-06-M-0480

Previous research has shown the performance of women-owned firms lagging male-owned firms on factors such as annual sales, employment growth, income, and venture survival. Reasons for the differences are often hypothesized, but empirical tests have historically suffered from data with a limited number of control variables on the motivations and characteristics of the owners. Moreover, many of the previous studies have suffered from survivor bias as they study existing (or surviving) businesses. This study seeks to determine why a performance difference exists for female- and male-owned ventures.

Overall Findings

When other factors are controlled for, gender does not affect new venture performance. However, several factors—differing expectations, reasons for starting a business, motivations, opportunities sought and types of businesses—vary between the genders, and these result in differing outcomes. Such observations should be taken into account when comparing the outcomes of ventures across genders.

Highlights

While gender was shown not to affect new venture performance when preferences, motivation, and expectations were controlled for, the differences observed among men's and women's new business ventures include the following:

- Men had more business experience prior to opening the business and higher expectations.
- Women entrepreneurs had a larger average household size.
- The educational backgrounds of male and female entrepreneurs were similar.

- Women were less likely than men to purchase their business.
- Women were more likely to have positive revenues, but men were more likely to own an employer firm.
- Female owners were more likely to prefer low risk/return businesses.
- Men spent slightly more time on their new ventures than women.
- Male owners were more likely to start a business to make money, had higher expectations for their business, and did more research to identify business opportunities.
- Male entrepreneurs were more likely to found technologically intensive businesses, businesses that lose their competitive advantage more quickly, and businesses that have a less geographically localized customer base.
- Male owners spent more effort searching for business opportunities and this held up when other factors were controlled for.
- Differences between women and men concerning venture size and hours are explained by control variables such as prior start-up and industry experience.
- Researchers and policymakers need to understand that studies which do not take into account the differing nature of men- and women-owned firms could result in misleading results.

Scope and Methodology

The data used was from the Panel Study of Entrepreneurial Dynamics (PSED). The PSED captures very small ventures on average and is a self-reported survey. The subset used was a sample

of representative entrepreneurs who started in 1998 and 1999, resulting in 685 usable new businesses. Women represented 349 cases as they were oversampled, and the data were weighted to account for the oversampling.

Various measures of performance outcome were studied, such as venture size. Many of the variables were on a scale from “no extent” to “a very great extent.” Econometric models were created to determine the relationship among the variables. The relatively small sample size, short time frame, and nascent nature of the ventures are limitations of the study.

This report was peer reviewed consistent with the Office of Advocacy’s data quality guidelines. More information on this process can be obtained by contacting the director of economic research at advocacy@sba.gov or (202) 205-6533.

Ordering Information

The full text of this report and summaries of other studies performed under contract with the U.S. Small Business Administration’s Office of Advocacy are available on the Internet at www.sba.gov/advo/research. Copies are available for purchase from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(800) 553-6847 or (703) 605-6000
TDD: (703) 487-4639

www.ntis.gov

Order number: PB2007-112634

Paper A05 (\$31.50)

Microfiche A01 (\$14.00)

CD-ROM A00 (\$24.00)

Download A00 (\$18.95)

For email delivery of Advocacy’s newsletter, press, regulatory news, and research, visit <http://web.sba.gov/list>. For Really Simple Syndication (RSS) feeds, visit www.sba.gov/advo/rsslibrary.html.

I. EXECUTIVE SUMMARY

This report describes a statistical evaluation of the similarities and differences between male and female entrepreneurs and their ventures. The purpose of the study was to gain a better understanding of the extent to which entrepreneurship by men and women is different. Using data from the Panel Study of Entrepreneurial Dynamics, the sample included 685 new business people who indicated that they were in the process of starting a business in 1998 or 1999.

Preferences, motivations and expectations are not randomly distributed across gender. Analyzing the effect of structural barriers on new venture performance requires precise measurement of the effects of gender on these things. Failure to measure the effect of preferences, motivations and expectations, or inaccurate measurement of the effect of these factors, will lead to biased estimates of the effects of structural barriers, and over- or under-estimation of their effects.

Our study contributes to the literature on gender differences in entrepreneurship by showing the presence or absence of support for many previous findings about gender differences in entrepreneurial activity. Specifically, the more limited findings shown in the PSED, in comparison to previous studies, indicate the limitations of previous studies, and suggest caution in assuming their validity. First, because the PSED is a survey of a representative sample of people in the process of starting new businesses in the United States differences between the findings here and those of prior studies might exist because the results of previous studies are artifacts of recall and selection bias. Second, differences might result from differences in “self-employment” on the one hand, and business formation on the other. Third, the differences might be explained by selection bias in previous studies, like the Survey of Small Business Finances, which survey surviving small businesses. Fourth, the differences might exist because of unobserved heterogeneity in previous studies that examine data sources like the Statistics of Income and the Current Population Survey, which include a limited number of variables.

Our study makes several contributions to public policy. First, it shows that there is no evidence in the PSED for the effect of gender on new venture performance when preferences, motivation and expectations are controlled. Second, the study provides information useful to policy makers who seek to analyze whether government intervention is needed to overcome structural barriers to female preferences, motivations, and expectations for new ventures.

II. BACKGROUND

A wide variety of research studies have shown differences between male and female entrepreneurs: motivations for starting businesses; their preferences for venture risk; the types of businesses they start; the process they use to identify business opportunities; the size of their start-ups; the effort they expend in developing of those businesses; their confidence in their start-up efforts; their start-up problems; their expectations for the performance of their businesses; and their performance outcomes (Brush, 1992; Brush et al., 2006; Carter et al., 1997; Du Rietz 1999; Fischer 1992; Rosa et al., 1996; Sexton and Bowman-Upton, 1990; Van Stel 2003; and Verhuel et al., 2004).

Despite the wealth of studies on this topic, some researchers have questioned how much we understand about the similarities and differences between male and female entrepreneurs because of limitations of the data that have been used to explore this question. These data are limited in four ways. First, many sources of data, such as the Current Population Survey, examine “self-employment.” While self-employment is an important phenomenon, it is not a good proxy for new business creation. Many self-employed people do not create new businesses, and many people who create new businesses are categorized by the Census Bureau as “wage employed” because wage employment is their primary source of income (Reynolds, 2000).

Second, many sources of data are quite limited in the information that they include. As a result, analysis of these data cannot control for many other factors, making the results subject to the limitation that gender may merely be proxying for unobserved characteristics that really account for the differences observed in the data.

Third, many data sources fail to measure entrepreneurial activity from the beginning of the process – that is, when a person begins to create a new firm. As a result, the data collected from this process is highly selective (only entrepreneurs running surviving firms are contacted). Moreover, the data collection process involves a great deal of recall bias, as entrepreneurs are asked to reconstruct events, attitudes, and motivations that took place months, and often years, before (Reynolds, 2000).

Finally, many data sources are convenience samples that are not representative of the underlying U.S. population. This is necessarily the case when studies use sampling frames – Dun and Bradstreet listings, unemployment insurance filings, new incorporations, trade association membership, and affiliation with a university – which are not representative of the overall population. As a result, one cannot draw inference from the results of these studies to the overall population of start-ups in the United States.

The data limitations make it difficult for policy makers to develop effective policies toward entrepreneurship because they cannot have confidence in the data on which they are making policy choices. Because researchers cannot undertake randomized experiments to discriminate against groups of entrepreneurs, gender-related policy questions in entrepreneurship need to be addressed through regression

analysis. Accurate regression analysis depends on the ability to measure and account for a variety of factors that could account for gender differences that policy intervention is designed to remedy (e.g., discrimination in capital markets). Given that the multitude of factors which needed to be ruled out are almost never randomly distributed across gender (e.g., motivations for starting a business, effort expended, expectations for performance or the types of businesses started), measuring gender differences in these alternative factors is essential to determining if discrimination adversely affects female entrepreneurs. Failure to measure them will likely lead to biased estimates, which could result in the over- or under-estimation of the need for policy intervention.

Moreover, even if the variety of factors that could account for the gender differences that the policy intervention is designed to address are controlled, accurate policy can be formulated on the basis of those findings only if the phenomenon of new business formation (and not something else, like self-employment) was examined in the studies, and only if the samples in the studies represent the population that the policy would effect, in this case the overall United States.

This study uses a new data set, called the Panel Study of Entrepreneurial Dynamics (PSED), to examine many of the differences between male and female entrepreneurs documented in the literature. The PSED examines new firm formation from the inception of the firm formation process for a sample of U.S. entrepreneurs that matches the distribution of the Current Population Survey in terms of gender, race, age, and income. Consequently, the PSED allows exploration of the difference between men and women in new business creation without being subject to many of the limitations (described above) that come from the examination of other data sets. As a result, this study permits examination of the differences between male and female entrepreneurs, which is necessary for policy makers to determine if policy intervention is needed, and, if so, what types of interventions (e.g., laws to prevent discrimination, education and support programs, and so on) should be used to alleviate the problems.

It is important to note that the PSED suffers from its own limitations. First, the PSED data are obtained through a survey, and the self-reported data are not verified through corroboration with another data source. Therefore, the answers given by respondents to the PSED may not be entirely accurate and might only reflect differences in the way in which male and female entrepreneurs answer questions.

Second, the small sample size and short time horizon of the PSED might account for many of the null findings. Because many of the differences between male and female entrepreneurs discussed in the literature come from the examination of very large datasets, substantive differences between entrepreneurs of the two genders may not be statistically significant in the PSED because the sample size is very small. In addition, because the PSED begins with the examination of people in the process of starting a business and gathers data only over four years, it may not show differences that become visible only after the businesses age.

Third, the PSED mixes entrepreneurs with people who say they are starting a business, but fail to do so within the study period. Only one-third of the PSED sample has a business that the respondent views as “up-and-running” at any time during the four-year observation period. This small proportion suggests that the majority of the sample consists of people who never actually get a new business started. The inclusion of these people in the sample might explain the divergence of the findings from those observed in other datasets that look only at employer firms or people for whom self-employment is their primary occupation.

Fourth, differential selection into starting a business might account for many of the patterns observed among male and female entrepreneurs because men are twice as likely as women to start businesses. Therefore, women entrepreneurs might not differ much from male entrepreneurs, because a more selected group of women start businesses. If women started businesses at the same rate as men, then more differences between male and female entrepreneurs might be observed.

In the next section, we briefly review the findings of previous researchers about gender differences on a variety of dimensions of entrepreneurial activity and use them to formulate hypotheses that we would expect to be supported in our investigation.

III. PREVIOUS RESEARCH & HYPOTHESES

Previous studies have shown that male and female entrepreneurs differ in terms of their business outcomes; the motivations they have for starting businesses; the effort that they put into the development of their businesses; the size of their start-ups; the types of businesses they start; the performance expectations they have for their businesses; their preferences for venture risk; the process through which they identify business opportunities; the confidence they have in their start-up efforts; and the start-up problems that they face (Brush, 1992; Brush et al., 2006; Carter et al., 1997; Du Rietz 1999; Fischer 1992; Rosa et al., 1996; Sexton and Bowman-Upton, 1990; Van Stel 2003; and Verhuel et al., 2004). We review each of these topics in turn, and then posit ten hypotheses for the current study.

III.1 Firm Performance

Studies have shown that the performance of female-led new ventures lags behind that of male-led new ventures. Sales growth, employment, employment growth, income, and venture survival are all lower for female-led ventures (Boden, 2000; Office of Advocacy, 2006; Robb and Wolken 2002; Srinivasan, et al., 1993). Women-owned businesses have lower sales and employ fewer people than men (Fischer et al., 1993). For instance, in 2002 women-owned employer firms generated an average of \$87,585 in sales and had an average of 7.79 employees, as compared to \$1,862,159 in sales and 12.04 employees for those owned by men (Office of Advocacy, 2006). Women-owned businesses are less profitable than those started by men. The average employer-firm owned by a woman generates only 78 percent of the profit of the comparable business owned by a man (Robb and Wolken, 2002). Moreover, 46 percent of self-employed women had an

income of less than \$15,000 in 1998, while only 21 percent of self-employed men earned this low level. In contrast, 16 percent of self-employed men earned more than \$95,000, as compared to 4 percent of women (Office of Advocacy, 2001). New ventures started by women are less likely to survive over time than new ventures started by men. The four-year survival rate of new women-owned employer firms is 8.6 percent lower than that of comparable new businesses founded by men (Boden, 2000; Srinivasan et al, 1993). Finally, research from Norway shows that new ventures started by women are slower to complete the organizing activities necessary to get their businesses “up-and-running” (Alsos and Ljunggren, 1998).

These observations lead to our first hypothesis:

Hypothesis 1: The performance of new ventures led by female entrepreneurs is lower than the performance of ventures led by male entrepreneurs.

III.2 Motivations for Starting the Business

People start businesses for a variety of different reasons; and these motivations vary by gender. First, women are more likely than men to start businesses to achieve a work-family balance (Brush et al., 2006). In surveys, women cite the desire for flexibility and work-family balance as a reason they started their businesses more often than men (Boden, 1999; Carter et al., 2003). Parenthood plays a significant role in women’s desire to become self-employed (Birley 1989). Research shows that many women want to become self-employed to develop a more flexible work schedule that allows them to balance work and family demands (Boden 1996; Georgellis and Wall, 2004; Lombard 2001). They also pursue self-employment because it allows them to work at home; and may ease the burden of finding childcare (Boden 1996; Connelly 1992; Presser and Baldwin, 1980). In fact, Boden (1996) uses data from the Current Population Survey to show that, there is a significant positive correlation for women between entrance into self-employment and becoming a parent.

Second, male entrepreneurs are much more likely than female entrepreneurs to say that the desire to make money or build a company were the reasons why they started their businesses. For instance, DeMartino and Barbato (2003) found that male entrepreneurs prefer careers that make money, while female entrepreneurs prefer careers that allow work-family balance. Women also place higher value on non-financial dimensions of employment than men do (Jurik, 1998). They are more likely than men to cite personal interests, a desire for self-fulfillment, and job satisfaction as their reasons for starting businesses (Georgellis and Wall, 2004; Jurik 1998). Women are also more likely than men to say that they started their businesses to be challenged personally and to achieve self-determination (Buttner and Moore, 1997).

Third, women are more likely than men to start businesses to gain the recognition of others (Fischer et al., 1993). Shane et al (1991) found that women in the United Kingdom and in Norway are more likely than men in those countries to start businesses to “achieve something and get recognition for it” (page 438).

These observations lead to our second hypothesis:

Hypothesis 2: Male and female entrepreneurs start businesses for different reasons.

III.3 Effort Expended on New Business Creation

Researchers have found that female entrepreneurs, on average, work fewer hours than male entrepreneurs. In particular, studies have shown that women invest less time in the development of their new businesses than men (Verheul et al., 2004). They also indicate that self-employed women are less likely to work full-time than self-employed men (OECD, 1998).

Male entrepreneurs may work more hours than female entrepreneurs because they are more likely to have gone into business to earn money. Alternatively, they may face fewer competing demands for their time because women devote more hours to caring for children, older parents, and the household. Competing domestic demands may restrict the time and effort that women can devote to other things, such as venture formation, leading women to spend less time on their new ventures than their male counterparts.

This leads to our third hypothesis:

Hypothesis 3: Male entrepreneurs spend more hours on the development of their ventures than female entrepreneurs.

III.4 Venture Size

Women start businesses that are smaller than those started by men. Studies of surviving businesses show that those that are women-owned are smaller than those that are men-owned (Kalleberg and Leicht, 1991). In addition, women start businesses with lower levels of initial employment and capitalization than men (Brush, 1992; Carter et al., 1997). The smaller scale of female-led start-ups is believed to be the result of a lack of access to larger-scale business opportunities and the financial resources necessary to develop them (Reynolds, forthcoming) and different goals and intentions for their businesses (Carter and Allen, 1997).

These observations lead to our fourth hypothesis:

Hypothesis 4: Male entrepreneurs start businesses of larger magnitude than female entrepreneurs.

III.5 Type of Business Started

Male and female entrepreneurs do not start the same types of businesses. Female-led businesses are more likely to be found in personal services and retail trade and less likely to be found in manufacturing and high technology (Anna et al., 2000; Brush et al., 2006). In addition, women start businesses that are less

growth-oriented and less driven by opportunity, and more oriented toward wage substitution (Minniti et al, 2005).

Some researchers argue that gender differences in the types of businesses that men and women found are the result of socialization and structural barriers. Women tend to work in certain occupations and industries because these occupations and industries are more socially acceptable for women, and because women face obstacles to working in other industries and occupations (Mirchandani, 1999). Because entrepreneurs tend to identify opportunities to start businesses that are similar in type and industry to those in which they previously worked, the tendency of women to work in certain types of businesses leads them to start those types of companies.

In addition, some businesses cannot be founded easily by people without the appropriate educational background. This is particularly the case for businesses that rely heavily on technology. Because women are less likely than men to study engineering or science (Brush et al., 2006), they often lack the education to start businesses that demand technical skills.

Furthermore, some businesses are inherently easier to start than others because they have lower barriers to entry. Women may be more likely to start businesses that face low barriers to entry because these businesses make lesser demands on human or financial capital than other businesses, and women may lack these types of capital.

These observations lead to the following hypothesis:

Hypothesis 5: Male and female entrepreneurs start different types of businesses.

III.6 Expectations for Venture Performance

Female entrepreneurs have lesser expectations for their businesses than male entrepreneurs. First, they expect to generate lower profits and employ fewer people than male entrepreneurs because they are less highly motivated to make money and more motivated to achieve other goals (Brush, 1992). Second, male entrepreneurs have greater confidence in their entrepreneurial abilities than female entrepreneurs. These differences in confidence lead male entrepreneurs to form greater expectations for their businesses. Third, female entrepreneurs tend to start types of businesses that have lower growth and income potential than male entrepreneurs. As a result, the expectations of female entrepreneurs, which are in line with the reality of the businesses that they start, are lower than those of male entrepreneurs. Fourth, female entrepreneurs are more likely to set limits beyond which they do not want to expand their businesses to ensure that they do not adversely affect their personal lives (Cliff, 1998). Fifth, female entrepreneurs start smaller scale businesses than male entrepreneurs; hence their initial expectations for their businesses tend to be lower (Anna et al, 2000).

These observations lead to our sixth hypothesis:

Hypothesis 6: Male entrepreneurs have greater performance expectations for their businesses than female entrepreneurs.

III.7 Risk Preferences

Research in sociology and psychology shows that women are more risk averse than men across a wide variety of settings (Arch, 1993; Byrnes et al., 1999). In particular, women display greater financial risk aversion than men (Jianakoplos and Bernasek 1998). Some studies suggest that this greater risk aversion carries over to female entrepreneurs. In fact, one study shows that a convenience sample of female entrepreneurs have lower risk propensity scores than male entrepreneurs on a psychological scale (Sexton and Bowman-Upton, 1990). The greater risk aversion of female entrepreneurs is thought to make them less willing to trade potential gain for risk, which leads them to prefer businesses with lower failure probabilities than those preferred by male entrepreneurs (Brush et al., 2006). As a result, male entrepreneurs pursue business opportunities that involve more risk than the opportunities pursued by female entrepreneurs (Baker et al., 2003). The greater risk aversion of female entrepreneurs also leads them to engage in greater amounts of risk minimizing activity. For instance, Mallette and McGuiness (2004) found that the female entrepreneurs focus more on minimizing risk than male entrepreneurs in the business organizing process.

These observations lead to our seventh hypothesis:

Hypothesis 7: Male entrepreneurs prefer riskier ventures than female entrepreneurs.

III.8 Opportunity Identification

Female entrepreneurs search for new business opportunities differently than male entrepreneurs for a variety of reasons. First, many opportunities are identified through information that is transferred through social networks. Women have different types of social networks than men (Renzulli et al., 2000). As a result, they have access to different sources of information about opportunities. For instance, male entrepreneurs are more likely than female entrepreneurs to identify opportunities through conversations with investors and bankers because, on average, they know more investors and bankers.

Second, learned behaviors and social norms lead men and women to develop different cognitive processing styles (Gatewood et al., 1995). As a result, on average, men and women gather information and solve problems differently (White et al., forthcoming) For instance, female entrepreneurs are thought to learn from a greater variety of sources than male entrepreneurs, while male entrepreneurs are thought to learn more from setbacks than female entrepreneurs (Barrett, 1995). In addition, the greater risk aversion of female entrepreneurs may lead them to search for more information that mitigates the potential risks about business opportunities than their male counterparts (Eckel and Grossman, 2003).

These observations lead to the eighth hypothesis.

Hypothesis 8: Male and female entrepreneurs identify business opportunities differently.

III.9 Confidence in Organizing Abilities

Because of how men and women are socialized, women have lower levels of career-related self-efficacy than men, particularly in careers that are seen as traditionally “male” (Brown, 2002). Because starting a business has been considered a traditionally “male” career, female entrepreneurs are thought to have less confidence in their entrepreneurial abilities than male entrepreneurs. As a result, they are less likely to believe that they can undertake the key tasks in organizing a new venture, such as obtaining start-up and working capital, and attracting customers.

This argument leads to our ninth hypothesis:

Hypothesis 9: Male entrepreneurs have more confidence in their abilities to organize their new ventures than female entrepreneurs.

III.10 Start-up Problems

Research suggests that social norms about the role of women in society, the shortage of female role models, and the greater household burdens faced by women lead female entrepreneurs to face more start-up problems, and for those problems to be of greater magnitude, than their male counterparts. For instance, attitudes toward the role of women make it more difficult for female entrepreneurs to be taken seriously as business people (Brush, 1992), and to gain support for their entrepreneurial activities from their spouses, family, and friends (Stoner et al., 1990). In addition, the relative shortage of female role models makes it more difficult for female entrepreneurs to obtain adequate mentorship for their start-up efforts. Furthermore, the greater household and childcare responsibilities of women lead them to have more trouble balancing business formation and family responsibilities (Stoner et al., 1990).

These observations lead to the tenth hypothesis:

Hypothesis 10: Female entrepreneurs face more start-up problems than male entrepreneurs.

IV. DATA & RESEARCH METHODOLOGY

IV.1 Sample

We use data from the Panel Study of Entrepreneurial Dynamics (PSED) to conduct the analysis that is discussed in this report. The PSED is a multi-year effort to follow a representative sample of people who

were involved in the business formation process in 1998 and 1999 (Reynolds, 2000). To create a sample representative of people in the lower 48 states who were involved in the business formation process at this time, researchers contacted 64,622 U.S. households between July of 1998 and January of 2000 through random digit dialing (Reynolds and Curtin, 2004). They screened the first adult who agreed to participate, subject to quotas to ensure an equal number of men and women (Reynolds and Curtin, 2004).

In the screening process, three telephone attempts were made to contact blocks of 1,000 potential respondents over a three-day period, with the same number of people contacted on weekdays and weekends (Reynolds, 2000). People who were contacted were identified as being entrepreneurs if they answered ‘yes’ to the question: “Are you, alone or with others, now trying to start a new business?” The entrepreneurs were offered \$25 to participate in an hour-long telephone phone survey. Approximately 71 percent agreed to participate, and could be contacted (Reynolds and Curtin, 2004). However, 27 percent of the respondents were eliminated from the survey because the respondents indicated that their businesses already had positive cash flow for three consecutive months, which the PSED researchers considered to be “beyond the start-up phase” (Reynolds, 2000). Those respondents who completed the telephone survey were offered another \$25 if they would also complete a mail survey, which 72 percent did (Reynolds and Curtin, 2004; Reynolds, 2000). These respondents were also re-contacted 12, 24 and 36 months later for follow-up telephone and mail surveys.

The respondents were treated as key informants about their new ventures. Information was collected about a wide variety of topics, including demographic characteristics; background and experience; motivations, beliefs, and attitudes; perceptions of new ventures and the environment; new venture strategy; organizing activities; the achievement of milestones; financial investments made in the ventures; performance expectations; the use of assistance and educational programs; and a variety of other topics (Reynolds, 2000).

The sample included 830 people who indicated that they were in the process of starting a business in 1998 or 1999. However, the analysis reported here is limited to the 711 respondents that were in the process of starting a business that was independent of their employer’s company. An additional 26 respondents indicated that the start-up effort was not active in the past 12 months and were dropped from the sample. As a result, the usable sample includes 685 new businesses, 481 of which completed the additional mail survey. Due to over-sampling of women, 349 of the entrepreneurs were female.

Because the research effort over-sampled women and minorities, and because some categories of respondents were less likely than others to be reached or to respond to the surveys, post-sampling stratification weights were used to match the data to the Current Population Survey on gender, age, education, and race (Reynolds and Curtin, 2004). In the analysis presented here, the weights were re-centered on 1.0 for the usable subsample to avoid biases in the standard errors (Reynolds, 2000).

IV.2 Analysis

The data were examined in two ways. First, descriptive statistics were examined to compare male and female entrepreneurs on a variety of dimensions that correspond to the arguments made in the literature. In addition, the differences in the variance in characteristics across male and female entrepreneurs were explored, both to explain those differences, and to ensure that subsequent regression analysis to examine these differences is done accurately. Second, the effect of gender on those dimensions for which bivariate analysis shows statistically significant and substantive differences were examined in a regression framework that controls for a variety of factors that might alternatively account for the differences between male and female entrepreneurs on these dimensions. Given the nature of the dependent variables, two types of regression models were used. For the continuous variables, we used ordinary least squares regression. For the dichotomous variables, we used logistic regression.

IV.3 Variables

The study involved the examination of the effect of gender on several different dependent variables and employed a variety of control variables. These variables are described below, with the dependent variables described first.

IV.3.a Dependent Variables

We examined several different dependent variables to measure the factors posited in the ten hypothesis: performance outcomes; effort expended; motivations to start a business; venture size; the nature of the venture; expectations for income and employment; risk preferences; approach to opportunity identification; confidence in venture organizing; and start-up problems faced. We begin with performance outcomes.

IV.3.b Performance Outcomes

We examined seven different measures of performance: venture termination; becoming an employer firm; level of employment achieved; achievement of first sale; achievement of positive cash flow; count of organizing activities undertaken; and perception that the venture is “up and running.” Because the PSED involves the collection of follow-up data on new ventures at three additional times after the initial interview, it is possible to look at performance outcomes that occurred over a four-year period.

We measured *venture termination* with a dummy variable of one if the effort to develop the venture was stopped by all parties working on it at any time in four years covered by survey. Specifically, termination will be identified as occurring when the respondent answers “no” to the PSED question: “Are you, or is anyone else, still actively pursuing the creation of this venture?”

The U.S. government measures new employer firms (which it defines as firms that have at least one employee, including the founders) based on unemployment insurance filings. Because many new ventures do not become employer firms, this status is an important milestone in the lives of new ventures. We measure *employer firm* with a dummy variable of one if the venture paid unemployment insurance taxes at any time in four years covered by survey.

We measure *employment* as the number of non-founder employees of the venture at the end of the four years covered by survey. If the venture is terminated, its employment is coded as “zero.” If the venture is alive, but the respondent does not provide the number of employees in that year, we take the latest available employment provided by the respondent. We calculate part-time employment as one-half of full time employment. Because the employment number is skewed, in the analysis we also use the natural log of the employment plus one. For the same reason, we also operationalize employment with a dummy variable of one if the venture has any employees other than the founder and zero if it does not.

We measure *has revenues* with a dummy variable of one if the venture receives income from the sale of goods or services at any time in four years covered by survey. Specifically, having revenues is identified when the respondent answers the question: “Has the venture received any money, income, or fees from the sales of goods or services.”

We measure *achieved positive cash flow* with a dummy variable of one if the venture had revenues which exceeded expenses in any month in the four years covered by survey. Specifically, positive cash flow is identified when the respondent answers “yes” to the question: “Do monthly revenues exceed monthly expenses?”

We measure *organizing activities completed* as the count of the following venture organizing activities completed by the end of the four years covered by survey: initiated marketing; completed product development; purchased raw materials; obtained equipment; identified a market opportunity; established a business bank account; established a business telephone line; invested money in the business; sought financing; obtained supplier credit; filed FICA; and paid federal taxes. Each of these activities is identified as occurring when the respondent answers “yes” to questions about them at each wave of the survey.

We measure “*up-and-running*” with a dummy variable of one if the respondent perceives the venture to be “up-and-running” at any time in the four years covered by survey. Specifically, we measure the perception that the business is “up-and-running” if the respondent indicates that the venture is an “operating business” when asked: “How would you describe the current status of the business?”

IV.3.c Motivations for Starting the Business

We examined four different motivations for starting a business: to be in charge; to make money; to have more flexibility in one’s personal life; and for social reasons. Based on a factor analysis of the items

making up the motivations section of the mail questionnaire, scales were constructed for four different motivations.

The first motivation was measured by a four-item scale ($\alpha = 0.76$) entitled “*start a business to be innovative and learn.*” It was composed of the following reasons the entrepreneur established a new business, which participants evaluated on a five point scale from “no extent” to “a very great extent”: “to lead and motivate others;” “to have the power to influence an organization;” “to be innovative and at the forefront of technology;” “to develop an idea for a product.”

The second motivation was measured by a three-item scale ($\alpha = 0.79$) entitled “*start a business to earn money.*” It was composed of the following items measured on a five point scale from “no extent” to “a very great extent.” The statement reads, I started this business “to build great wealth or a high income;” “to earn a larger personal income;” and “to build great wealth or a higher income.”

The third motivation was measured by a four-item scale ($\alpha = 0.67$) entitled “*start a business to have more independence and flexibility.*” It was composed of the following reasons the entrepreneur established a new business, measured on a five-point scale from “no extent” to “a very great extent”: “to obtain flexibility for my personal and family life;” “to have freedom to adapt my own approach to work;” “to grow and learn as a person;” and “to challenge myself.”

This motivation was also measured by a single item that asks the respondent to indicate on a five-point Likert scale from “completely untrue” to “completely true” their belief in the statement that “owning my own business is more important than spending time with my family.”

The fourth motivation was measured by a three-item scale ($\alpha = 0.64$) entitled “*start a business for recognition.*” It was composed of the following reasons the entrepreneur established a new business, measured on a five-point scale from “no extent” to “a very great extent;” “to continue a family tradition;” “to be respected by my friends;” and “to follow the example of a person I admire.”

This motivation was also measured by a single item that asks the respondent to indicate, on a five-point Likert scale from “completely disagree” to “completely agree,” the degree to which they believe that “most of the leaders in the community are people who own their own businesses.”

IV.3.d Effort Expended to Start the Business

We examined four different measures of the effort expended by the entrepreneurs: the number of hours spent on the venture in its first year; the number of hours per day spent on the venture; the number of days that the entrepreneur had off during the previous month; and the number days the entrepreneur worked in the previous week.

We measured *first-year hours* as the number of hours that the respondent reported spending on the venture in its first year. Because this variable was skewed, we also examined the natural log of it in our analysis. We measured *hours per day* as the number of hours per work day that the entrepreneur reported

spending on the venture. We measured *days off* as the number of days off from work in the previous month that the entrepreneur reported having worked. Finally, we measured *work days* as the number of days in the previous week that the respondent reported having worked.

IV.3.e Venture Size

We measured the magnitude of the ventures in three ways: by the amount of money that the founders invested in the business during the four years of its development; by the founders' estimates of the amount of time it would take for the venture to break even; and by the founders' estimates of amount of money needed for the venture to have positive cash flow.

We measured the *amount invested* as the dollar value of the money put into the venture by all founders at any time in the four years covered by survey. Because this variable was skewed, we also examined the natural log of it in the analysis.

We measured the *break even point* as the founder's estimate, made at the time of the initial interview, of the amount of money needed before monthly income is greater than monthly expenses. Because this variable was skewed, we also examined the natural log of it in the analysis.

We measured the *time to break even* as the founder's estimate, made at the time of the initial interview, of the amount of time in months that it was expected to take for the venture to pay back start-up costs. Because this variable was skewed, we also examined the log of it in the analysis.

IV.3.f Type of Business Started

We explored three dimensions of business type: the importance of technology to the business; the degree of competition expected; and the geographic localization of the business.

We examined two measures of the importance of technology. The first is a three item scale ($\alpha = 0.67$) entitled "*the importance of technology*." It is composed of the following items, measured on a five-point scale from "insignificant" to "critical": "importance to the start-up of having new product technology;" "the importance to the start-up of having new process technology;" and "the importance to the start-up of having a technology or science expert on the team." The second is a dummy variable that took the value of one if the respondent considered the business to be "high tech."

We examined four measures of the degree of competition expected by the entrepreneur. The first, *level of competition*, was a question that asked the respondent to indicate the level of competition (at the time of the first interview) that he or she expected the venture to face on a four-point Likert scale from "expect no competition" to "expect strong competition." The second, *sales by competitors* is the respondent's estimate (at the time of the first interview) of percentage of sales in the industry accounted for by the venture's three largest competitors. The third, *competitive advantage*, was a dummy variable of one if the respondent indicated (at the time of the first interview) that the venture had a competitive advantage. The fourth, *months*

before losing competitive advantage is the respondent's estimate (at the time of the first interview) of the number of months before venture will lose its competitive advantage. (If the respondent indicated an "indefinite advantage," the value of that advantage was set at 240 months.)

We examined four measures of the geographic localization of the business. The first, *percent local* is the respondent's estimate of the percentage of customers in the first "three-to-four years" that will be located "within 20 miles." The second, *percent non-local* is the respondent's estimate of the percentage of customers in the first "three-to-four" years that will be from "20-100 miles away." The third, *percent national*, is the respondent's estimate of the percentage of customers in the first "three-to-four" years that will be from "more than 100 miles away, but in the U.S." The fourth, *percent international*, is the respondent's estimate of the percentage of customers in the first three-to-four years" that will be from "outside the U.S."

IV.3.g Expectations for Venture Performance

We looked at two dimensions of expectations: employment expectations and income expectations. We examined two measures of employment expectations. The first, *expected first-year employment*, is the number of employees that the respondent indicated, at the time of the first interview, that he or she expects the venture to have at the end of its first full year of operation. Because this variable was skewed, we also predict the natural log of it in the analysis. The second, *expected fifth-year employment*, is the number of employees that the respondent indicated, at the time of the first interview, that he or she expects the venture to have at the end of its fifth full year of operation. Because this variable was skewed, we also predict the natural log of it in the analysis. We examined three measures of income expectations. The first, *expected first-year income*, is the dollar value of income that the respondent indicates, at the time of the first interview, that he or she expects the venture to have at the end of its first full year of operation. Because this variable was skewed, we also predict the log of it in the analysis. The second, *expected fifth-year income*, is the dollar value of income that the respondent indicates, at the time of the first interview, that he or she expects the venture to have at the end of its fifth full year of operation. Because this variable was skewed, we also predict the natural log of it in the regression analysis. The third, *odds primary income*, is the percentage odds, offered by the respondent, at the time of the first interview, that the venture will become the primary source of household income.

IV.3.h Risk Preferences

We examined three measures of risk preferences. The first measure, *low risk/return*, is a dummy variable of one, if the respondent would prefer to be the sole owner of "a business that would provide a good living, but with little risk of failure, and little likelihood of making you a millionaire" to "a business that was much more likely to make you a millionaire but had a much higher chance of going bankrupt." The second, *odds of operation*, is the respondent's estimate, at the time of the first interview, of the odds that his or her

venture will still be in operation in five years. The third, *percent alive*, is the respondent's estimate, at the time of the first interview, of the proportion of new ventures that will still be in operation in five years.

IV.3.i Opportunity Identification

We examined seven measures of opportunity identification, all of which were collected at the time of the first interview. The first measure is a scale (alpha = 0.65) entitled "*search for information*," composed of the following four items, measured on a five-point scale from "completely disagree" to "completely agree": "I have engaged in a deliberate, systematic search for an idea for a new business;" "for me, identifying business opportunities has involved several learning steps over time, rather than a one-time thing;" "if this business idea is not successful, I am willing to try up to five other business ideas before I go to work for someone else;" "if this business idea is not successful, I am willing to try up to ten other business ideas before I go to work for someone else." The second measure is a scale (alpha = 0.66) entitled, "*opportunity depends on action*," composed of three items, measured on a five-point scale from "completely disagree" to "completely agree": "If no action is taken to implement this business idea, an important location may not be available;" "if no action is taken to implement this business idea, the opportunity may not be available;" "if no action is taken to implement this business idea, important personal relationships may dissolve." The third measure, *amount of information*, is a single item that asks the respondent to indicate, on a four point Likert scale from "none" to "a great deal," the amount of new information acquired in recognizing the entrepreneur's business opportunity. The fourth measure, *number of ideas*, is a count of the number of ideas that the respondent considered in developing the venture. The maximum value that this item is allowed to take is nine. The fifth measure, *odds of upside*, is a three-point Likert scale item measured from "unimportant" to "very important" about the value of gathering information about the odds of a positive outcome when choosing between two businesses. The sixth measure, *odds of downside*, is a three-point Likert scale item measured from "unimportant" to "very important" about the value of gathering information about the odds of bankruptcy when choosing between two businesses. The seventh measure, *information on magnitude*, is a three-point Likert scale item measured from "unimportant" to "very important" about the value of gathering information on the exact amount of earnings generated by two successful businesses when choosing between them.

IV.3.j Confidence in Organizing Abilities

We examined nine measures of confidence in organizing abilities, each capturing the entrepreneur's confidence in a different aspect of the start-up process. Each measure is a five-point Likert scale item measured from "very low certainty" to "very high certainty" of the entrepreneur's confidence that the outcome will occur, "considering the economic and community context of the new firm." The measures are:

obtain working capital, obtain start-up capital, attract customers, deal with distributors, attract employees, obtain materials, compete, comply with laws, and keep up with technology.

IV.3.k Start-up Problems

We examined five types of start-up problems faced by entrepreneurs, each measured with a five-point Likert scale item from “completely untrue” to “completely true”: *balancing time* between business, personal and family life; *being taken seriously* as a business person; *receiving support* from one’s spouse, family, and friends; *lack of mentors* who can provide advice; and *obtaining health insurance*.

IV.3.l Predictor Variable

We measured the *gender* of the lead entrepreneurs on the ventures, with a male-led venture receiving a “one” in a dummy variable.

IV.3.m Control Variables

We control for the following in the regression analysis:

- The founder’s *industry experience*, with a count of the number of years that the founder previously worked in the same industry as the new business.
- The founder’s *start-up experience*, with a count of the founder’s prior start-ups.
- The largest number of people that the respondent had ever *supervised* in his or her career, with a count of that number.
- Experience *managing a business owned by others*, with a dummy variable of one if the respondent indicates that he or she is “managing a business owned by others, either as the senior executive or as a member of the senior management team.”
- The *age* of the founder in years.
- The founder’s *race*, with a series of dummy variables for Asian, Black, Hispanic, and White. (Asian is the omitted case.)
- The founder’s *education*, with a series of five dummy variables for the maximum education of the respondent: did not graduate high school, graduated high school, some college, college graduate, post graduate studies. (Post graduate studies is the omitted case.)
- The founder’s *marital status*, with a dummy variable of one if the respondent is married.
- The founder’s *household size*, with a count of the number of people in the household.
- Whether the founder was a *homemaker*, using a dummy variable of one if the respondent indicates this in the affirmative.
- The natural log of the dollar value of *household net worth*.

- The *employment status* of the respondent at the time that he or she was surveyed in the first interview, with dummy variables for employed full time, employed part time, retired, and unemployed. (Employed full-time is the omitted case.)
- The founder's *residential tenure*, with a count of the number of months that the person has lived in the current county where they reside.
- The self-employment status of the founder's parents, with a dummy variable of one if the respondent's *parents were self-employed* or owned their own business.
- The *organizational form* of the new business (independent start-up, purchase, franchise, or company-sponsored), with a series of dummy variables. (Independent start-up is the omitted case.)
- Nine basic *industry sectors*: agriculture; construction; finance, insurance, and real estate; manufacturing; public sector; retail trade; services; transportation and communication; and wholesale trade, with a series of dummy variables. The public sector is the omitted case.

IV. RESULTS

We provide both bivariate and multivariate analysis of the data. We summarize the bivariate analysis first.

IV.1 Means and Distributions

In reporting the bivariate analysis of the PSED data, we first discuss the control variables and then discuss the dependent variables.

IV.1.a Control Variables

Table 1 shows the distribution of entrepreneurs on the control variables that were measured as continuous variables. The table shows that male entrepreneurs have started significantly more prior businesses and have supervised significantly more people in prior jobs. On the other hand, the households of female entrepreneurs are significantly larger than those of male entrepreneurs. These differences suggest the importance of accounting for household size, number of prior start-ups, and maximum number of employees supervised when examining the effect of gender on entrepreneurial activity. Uncontrolled, gender would capture some portion of the differences in these variables.

Table 1. The Continuous Control Variables.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25th Percentile | 50th Percentile | 75th Percentile | Significance |
|---------------------|----------|-----|-----------|--------------------|----------|------------|-------------|-----------------|-----------------|-----------------|--------------|
| Age | All | 679 | 39.00 | 11.31 | 38.00 | 18.00 | 74.00 | 30.00 | 38.00 | 47.00 | |
| | Male | 414 | 38.70 | 11.81 | 37.00 | 18.00 | 74.00 | 29.00 | 37.00 | 46.00 | |
| | Female | 265 | 39.47 | 10.50 | 39.00 | 19.00 | 74.00 | 31.00 | 39.00 | 47.00 | |
| Household Size | All | 684 | 3.19 | 1.60 | 3.00 | 1.00 | 8.00 | 2.00 | 3.00 | 4.00 | * |
| | Male | 416 | 3.08 | 1.59 | 3.00 | 1.00 | 8.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 267 | 3.35 | 1.62 | 3.00 | 2.00 | 8.00 | 2.00 | 3.00 | 4.00 | |
| Industry Experience | All | 685 | 13.35 | 16.51 | 8.02 | 0.00 | 127.00 | 1.00 | 8.02 | 20.00 | |
| | Male | 417 | 14.15 | 17.45 | 9.08 | 0.00 | 127.00 | 2.00 | 9.08 | 20.00 | |
| | Female | 268 | 12.11 | 14.87 | 8.00 | 0.00 | 98.00 | 1.00 | 8.00 | 17.78 | |
| Prior Start-ups | All | 685 | 1.83 | 4.10 | 1.00 | 0.00 | 49.00 | 0.00 | 1.00 | 2.00 | * |
| | Male | 417 | 2.09 | 4.73 | 1.00 | 0.00 | 49.00 | 0.00 | 1.00 | 2.00 | |
| | Female | 268 | 1.44 | 2.80 | 1.00 | 0.00 | 30.00 | 0.00 | 1.00 | 2.00 | |
| Net Worth | All | 553 | \$145,215 | \$331,746 | \$45,000 | -\$380,000 | \$2,599,999 | \$13,000 | \$45,000 | \$150,000 | NS |
| | Male | 348 | \$146,089 | \$349,994 | \$45,663 | -\$380,000 | \$2,599,999 | \$15,000 | \$45,663 | \$143,873 | |
| | Female | 204 | \$143,726 | \$317,982 | \$40,000 | -\$175,000 | \$2,599,999 | \$10,000 | \$40,000 | \$170,000 | |
| Log of Net Worth | All | 485 | 10.93 | 1.62 | 10.92 | 0.00 | 14.77 | 9.90 | 10.92 | 12.04 | NS |
| | Male | 308 | 10.94 | 1.61 | 10.83 | 0.00 | 14.77 | 9.90 | 10.83 | 11.98 | |
| | Female | 177 | 10.92 | 1.64 | 10.96 | 5.30 | 14.77 | 9.90 | 10.96 | 12.21 | |
| Number Supervised | All | 573 | 47.81 | 176.59 | 12.00 | 0.00 | 3000.00 | 6.00 | 12.00 | 30.00 | * |
| | Male | 347 | 59.32 | 203.73 | 15.00 | 0.00 | 3000.00 | 6.00 | 15.00 | 40.00 | |
| | Female | 226 | 30.09 | 122.06 | 10.00 | 0.00 | 2000.00 | 5.00 | 10.00 | 20.00 | |
| Residential Tenure | All | 670 | 197.46 | 169.95 | 144.00 | 2.00 | 768.00 | 48.00 | 144.00 | 315.00 | |
| | Male | 410 | 193.27 | 169.78 | 144.00 | 2.00 | 768.00 | 48.00 | 144.00 | 312.00 | |
| | Female | 260 | 204.07 | 170.34 | 156.00 | 2.00 | 720.00 | 60.00 | 156.00 | 324.00 | |

Note: N= sample size, NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 2 shows the distribution of entrepreneurs by education. There are no statistically significant differences in the educational backgrounds of the male and female entrepreneurs.

Table 2. Highest Level of Education of Male and Female Entrepreneurs.

| | Category | N | Percentage | Significance |
|------------------|----------|-----|------------|--------------|
| No High School | All | 681 | 5.38 | NS |
| | Male | 414 | 6.26 | |
| | Female | 267 | 4.01 | |
| High School | All | 681 | 22.02 | NS |
| | Male | 414 | 21.89 | |
| | Female | 267 | 22.23 | |
| Post High School | All | 681 | 32.66 | NS |
| | Male | 414 | 31.13 | |
| | Female | 267 | 35.04 | |
| College | All | 681 | 25.98 | NS |
| | Male | 414 | 26.22 | |
| | Female | 267 | 25.59 | |
| Post College | All | 681 | 13.96 | NS |
| | Male | 414 | 14.49 | |
| | Female | 267 | 13.14 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 3 shows the distribution of entrepreneurs by employment status prior to starting their businesses. The table shows that male entrepreneurs are significantly more likely than female entrepreneurs to have been employed full-time prior and significantly less likely to not have been employed, or employed part-time. These differences suggest the importance of accounting for employment status when examining the effect of gender on entrepreneurial activity. Uncontrolled, gender would capture some portion of the differences in employment status.

Table 3. Employment Status of Male and Female Entrepreneurs Prior to Start-up.

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|--------------|----------|-----|----------|------------------------|--------------|
| Full Time | All | 684 | 70.74 | 45.55 | **** |
| | Male | 416 | 79.24 | 40.61 | |
| | Female | 267 | 57.49 | 49.53 | |
| Part Time | All | 684 | 14.74 | 35.47 | **** |
| | Male | 416 | 10.26 | 30.38 | |
| | Female | 267 | 21.71 | 41.31 | |
| Retired | All | 684 | 2.72 | 16.28 | |
| | Male | 416 | 2.93 | 16.90 | |
| | Female | 267 | 2.38 | 15.28 | |
| Not Employed | All | 684 | 11.80 | 32.29 | **** |
| | Male | 416 | 7.56 | 26.47 | |
| | Female | 267 | 18.41 | 38.83 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 4 shows the distribution of entrepreneurs by race. There are no statistically significant differences in the racial backgrounds of the male and female entrepreneurs.

Table 4. Racial Distribution of the Male and Female Entrepreneurs.

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|----------|----------|-----|----------|------------------------|--------------|
| White | All | 685 | 69.70 | 46.70 | NS |
| | Male | 417 | 67.05 | 47.06 | |
| | Female | 268 | 69.23 | 46.24 | |
| Black | All | 685 | 17.13 | 37.70 | NS |
| | Male | 417 | 16.29 | 36.97 | |
| | Female | 268 | 18.43 | 38.84 | |
| Hispanic | All | 685 | 10.43 | 30.59 | NS |
| | Male | 417 | 11.10 | 31.46 | |
| | Female | 268 | 9.38 | 29.21 | |
| Asian | All | 685 | 3.09 | 17.32 | NS |
| | Male | 417 | 3.99 | 19.59 | |
| | Female | 268 | 1.70 | 12.94 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 5 shows the distribution of industry sector in which the entrepreneurs started their businesses. The table shows that male entrepreneurs are significantly more likely than female entrepreneurs to start construction and manufacturing businesses, and significantly less likely than female entrepreneurs to start wholesale and retail trade businesses. These differences suggest the importance of accounting for industry

sector when examining the effect of gender on entrepreneurial activity. Uncontrolled, gender would capture some portion of the differences in industry sector.

Table 5. Industry Sector of the Start-ups of Male and Female Entrepreneurs.

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|------------------------------------|----------|-----|----------|------------------------|--------------|
| Agriculture | All | 674 | 3.74 | 18.98 | |
| | Male | 410 | 3.83 | 19.22 | |
| | Female | 263 | 3.59 | 18.64 | |
| Construction | All | 674 | 4.87 | 21.54 | * |
| | Male | 410 | 6.61 | 24.87 | |
| | Female | 263 | 2.16 | 14.56 | |
| Manufacturing | All | 674 | 5.20 | 22.22 | * |
| | Male | 410 | 6.71 | 25.05 | |
| | Female | 263 | 2.84 | 16.67 | |
| Transportation and Communication | All | 674 | 2.85 | 16.64 | |
| | Male | 410 | 3.58 | 18.60 | |
| | Female | 263 | 1.70 | 12.96 | |
| Wholesale Trade | All | 674 | 3.16 | 17.49 | t |
| | Male | 410 | 2.28 | 14.95 | |
| | Female | 263 | 4.52 | 20.81 | |
| Retail Trade | All | 674 | 26.14 | 43.97 | * |
| | Male | 410 | 23.46 | 42.43 | |
| | Female | 263 | 30.33 | 46.05 | |
| Finance, Real Estate and Insurance | All | 674 | 5.23 | 22.29 | |
| | Male | 410 | 5.14 | 22.11 | |
| | Female | 263 | 5.38 | 22.61 | |
| Services | All | 674 | 48.34 | 50.01 | |
| | Male | 410 | 47.78 | 50.01 | |
| | Female | 263 | 49.20 | 50.09 | |
| Public Administration | All | 674 | 0.48 | 6.90 | |
| | Male | 410 | 0.61 | 0.79 | |
| | Female | 263 | 0.27 | 5.22 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 6 shows the distribution of form of business entry. While there is no gender difference in the tendency to become an entrepreneur by starting an independent or a sponsored business, the table shows that male entrepreneurs are significantly more likely than female entrepreneurs to become entrepreneurs by purchasing an independent business, and significantly less likely than female entrepreneurs to become an entrepreneur by purchasing a franchise. These differences suggest the importance of accounting for form of

business entry when examining the effect of gender on entrepreneurial activity. Uncontrolled, gender would capture some portion of the differences in form of business entry.

Table 6. Form of Entry of the Start-ups of Male and Female Entrepreneurs.

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|----------------------|----------|-----|----------|------------------------|--------------|
| Independent Start-up | All | 683 | 87.37 | 33.24 | |
| | Male | 416 | 88.70 | 31.69 | |
| | Female | 267 | 85.30 | 35.48 | |
| Purchase | All | 683 | 2.44 | 15.43 | t |
| | Male | 416 | 3.37 | 18.07 | |
| | Female | 267 | 0.98 | 9.88 | |
| Franchise | All | 683 | 6.33 | 24.36 | ** |
| | Male | 416 | 4.28 | 20.26 | |
| | Female | 267 | 9.52 | 29.40 | |
| Sponsored Business | All | 683 | 3.86 | 19.29 | |
| | Male | 416 | 3.65 | 18.77 | |
| | Female | 267 | 4.20 | 20.10 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 7 summarizes the analysis for some of the other dichotomous variables (i.e., with “yes/no” answers): the percentage of the entrepreneurs that are married, homemakers, managing a business owned by others, and who have self-employed parents. The table shows that male entrepreneurs are significantly less likely than female entrepreneurs to be homemakers or to have self-employed parents. These differences suggest the importance of accounting for these factors when examining the effect of gender on entrepreneurial activity. Uncontrolled, gender would capture some portion of the differences in whether respondents were homemakers or had self-employed parents.

Table 7. Other Dichotomous Variables

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|--------------------------------|----------|-----|----------|------------------------|--------------|
| Married | All | 681 | 58.00 | 49.30 | NS |
| | Male | 415 | 57.00 | 49.60 | |
| | Female | 266 | 61.00 | 48.80 | |
| Homemaker | All | 676 | 37.00 | 48.30 | **** |
| | Male | 415 | 23.00 | 41.90 | |
| | Female | 261 | 59.00 | 49.20 | |
| Parents Self-employed | All | 672 | 52.00 | 50.00 | * |
| | Male | 410 | 48.00 | 50.00 | |
| | Female | 262 | 58.00 | 49.50 | |
| Managing a Business Others Own | All | 679 | 14.00 | 34.90 | NS |
| | Male | 415 | 14.00 | 35.10 | |
| | Female | 263 | 14.00 | 34.70 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

IV.1.b Dependent Variables

We now turn to the gender differences in the dependent variables, beginning with performance outcomes.

Performance Outcomes

Table 8 shows the gender differences in the dichotomous performance outcome variables. The table shows very little difference across gender, with the only statistically significant difference being in the percentage of businesses that became employer firms during the four years covered by the survey.

Nevertheless, this difference has important implications for policy makers. Most of the data that the government collects and examines to make policy on entrepreneurship is based on employer firms. As a result, the greater likelihood that male-led ventures will become employer firms has important implications for understanding potential selection bias in analysis of data on employer firms that is designed to develop policy about how to assist female entrepreneurs.

Table 8. Gender Differences in Dichotomous Performance Outcome Variables.

| | Category | N | Mean (%) | Standard Deviation (%) | Significance |
|--------------------|----------|-----|----------|------------------------|--------------|
| Employer Firm | All | 685 | 18.76 | 39.07 | ** |
| | Male | 417 | 21.85 | 41.37 | |
| | Female | 268 | 13.95 | 34.71 | |
| Terminated | All | 685 | 21.03 | 40.78 | NS |
| | Male | 417 | 20.15 | 40.16 | |
| | Female | 268 | 22.39 | 41.76 | |
| Has Revenues | All | 685 | 64.18 | 47.93 | NS |
| | Male | 417 | 61.94 | 48.61 | |
| | Female | 268 | 67.67 | 46.86 | |
| Cash Flow Positive | All | 685 | 41.34 | 49.28 | NS |
| | Male | 417 | 41.56 | 49.34 | |
| | Female | 268 | 41.00 | 49.28 | |
| Up-and-Running | All | 685 | 33.58 | 47.26 | NS |
| | Male | 417 | 32.88 | 47.04 | |
| | Female | 268 | 34.66 | 47.68 | |
| Employees >1 | All | 685 | 22.19 | 41.58 | NS |
| | Male | 417 | 20.07 | 40.10 | |
| | Female | 268 | 25.00 | 44.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Table 9 shows the continuous outcome variables. The overall lack of performance differences between male and female entrepreneurs on a variety of dimensions is also interesting, given the evidence in the literature documenting many of these differences. However, it is important to note that these are largely new businesses in process. Only one-third of the businesses are perceived by their founders to be “up-and-running” at any time during the four-year observation period, and one-third of them have no revenues at any time during the four years that they are observed. Therefore, it is possible that gender differences in performance only appear as the businesses become further developed.

Selection effects may account for the higher number of employees working in male-led firms. Although there are no statistically significant differences between the male and female entrepreneurs in the PSED in terms of the number of employees, the employment numbers are highly skewed. Not only is the median number of employees in all firms zero, but the 75th percentile of firms also has no employees.

However, the mean, standard deviation, and maximum number of employees are all higher for male-led firms. The top one percent of the male-led firms has an average of 147.6 employees, as compared to 58.25 employees in the top one percent of female-led firms. If larger firms tend to grow at a faster rate than smaller firms, as some research shows, then the gap between the top one percent of male- and female-led

firms will grow over time. As a result, as these firms mature, the employment gap between male- and female-led ventures might turn statistically significant.

Table 9. Gender Differences in the Continuous Performance Outcome Variables.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25th Percentile | 50th Percentile | 75th Percentile | Significance |
|----------------|----------|-----|------|--------------------|--------|---------|---------|-----------------|-----------------|-----------------|--------------|
| Organizing | All | 685 | 7.16 | 3.02 | 7.00 | 0.00 | 12.00 | 5.00 | 7.00 | 10.00 | NS |
| | Male | 417 | 7.18 | 3.05 | 7.00 | 0.00 | 12.00 | 5.00 | 7.00 | 10.00 | |
| | Female | 268 | 7.14 | 2.99 | 7.00 | 0.00 | 12.00 | 5.00 | 7.00 | 10.00 | |
| Employment | All | 685 | 1.86 | 12.78 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | NS |
| | Male | 417 | 2.15 | 15.43 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | |
| | Female | 268 | 1.42 | 6.86 | 0.00 | 0.00 | 102.50 | 0.00 | 0.00 | 0.50 | |
| Log Employment | All | 685 | 0.31 | 0.74 | 0.00 | 0.00 | 5.30 | 0.00 | 0.00 | 0.00 | NS |
| | Male | 417 | 0.31 | 0.76 | 0.00 | 0.00 | 5.30 | 0.00 | 0.00 | 0.00 | |
| | Female | 268 | 0.32 | 0.72 | 0.00 | 0.00 | 4.64 | 0.00 | 0.00 | 0.41 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Motivations for Starting the Business

Table 10 shows the motivation variables. The table shows that there is no statistically significant difference between male and female entrepreneurs on the scale measuring the motivation to start a business to be innovative and learn, or on the scale measuring the motivation to start a business to gain the recognition of others. However, male entrepreneurs are more likely than female entrepreneurs to indicate that the leaders in their community are business owners, and that difference is statistically significant.

As the previous literature suggests, male entrepreneurs score higher on the scale measuring the motivation to start a business to make money, and this difference is statistically significant.

Finally, male entrepreneurs score lower than female entrepreneurs on the scale measuring the motivation to start a business to have more flexibility for personal and family life, and this difference is statistically significant. Moreover, male entrepreneurs are more likely than female entrepreneurs to indicate that starting a business is more important than spending time with their families, a difference that is statistically significant.

Table 10. The Start-up Motivations of Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25th Percentile | 50th Percentile | 75th Percentile | Significance |
|-----------------------|----------|-----|-------|--------------------|--------|---------|---------|-----------------|-----------------|-----------------|--------------|
| Get Money | All | 472 | 11.64 | 3.02 | 12.00 | 3.00 | 15.00 | 10.00 | 12.00 | 14.00 | * |
| | Male | 279 | 11.93 | 2.84 | 12.00 | 3.00 | 15.00 | 11.00 | 12.00 | 14.00 | |
| | Female | 194 | 11.22 | 3.22 | 12.00 | 3.00 | 15.00 | 9.00 | 12.00 | 14.00 | |
| Have Flexibility | All | 472 | 16.71 | 2.89 | 17.00 | 4.00 | 20.00 | 15.00 | 17.00 | 19.00 | t |
| | Male | 281 | 16.52 | 2.87 | 17.00 | 4.00 | 20.00 | 15.00 | 17.00 | 19.00 | |
| | Female | 191 | 16.99 | 2.90 | 18.00 | 5.00 | 20.00 | 15.00 | 18.00 | 19.00 | |
| Get Recognition | All | 475 | 5.84 | 2.77 | 5.00 | 3.00 | 15.00 | 3.00 | 5.00 | 8.00 | NS |
| | Male | 282 | 5.83 | 2.72 | 5.00 | 3.00 | 14.00 | 3.00 | 5.00 | 8.00 | |
| | Female | 193 | 5.86 | 2.86 | 5.00 | 3.00 | 15.00 | 3.00 | 5.00 | 8.00 | |
| Be Innovative | All | 473 | 10.92 | 4.25 | 12.00 | 4.00 | 20.00 | 7.00 | 11.00 | 14.00 | NS |
| | Male | 282 | 11.17 | 4.33 | 11.00 | 4.00 | 20.00 | 8.00 | 11.00 | 14.00 | |
| | Female | 191 | 10.55 | 4.11 | 12.00 | 4.00 | 20.00 | 7.00 | 11.00 | 13.00 | |
| Owning More Important | All | 475 | 1.75 | 0.95 | 1.00 | 1.00 | 5.00 | 1.00 | 1.00 | 2.00 | ** |
| | Male | 281 | 1.85 | 0.98 | 2.00 | 1.00 | 5.00 | 1.00 | 2.00 | 2.00 | |
| | Female | 193 | 1.60 | 0.88 | 1.00 | 1.00 | 5.00 | 1.00 | 1.00 | 2.00 | |
| Community Leaders | All | 476 | 3.37 | 1.04 | 3.00 | 1.00 | 5.00 | 3.00 | 3.00 | 4.00 | * |
| | Male | 283 | 3.47 | 0.98 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 4.00 | |
| | Female | 193 | 3.22 | 1.11 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Effort Expended to Develop the Business

Table 11 shows the effort variables. While there is no statistically significant difference between male and female entrepreneurs in terms of hours spent on their new ventures each work day, male entrepreneurs spend a little more than a third of a day more per week on their new ventures, and have one and a half fewer days off per month, differences which are both statistically significant. In addition, while the 242 more hours per year that male entrepreneurs spend on their new ventures is not statistically different from the amount spent by female entrepreneurs, this null finding appears to be the result of the skewed nature of this measure of effort. The natural log of this variable shows a statistically significant difference between male and female entrepreneurs.

Table 11. The Number of Hours Spent on the Start-up Process By Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|----------------------------|----------|-----|------|--------------------|--------|---------|---------|-----------------------------|-----------------------------|-----------------------------|--------------|
| Hours Per Day | All | 466 | 2.00 | 2.68 | 1.00 | 0.00 | 15.00 | 0.00 | 1.00 | 3.00 | NS |
| | Male | 276 | 2.08 | 2.83 | 1.00 | 0.00 | 15.00 | 0.00 | 1.00 | 3.00 | |
| | Female | 190 | 1.90 | 2.44 | 1.00 | 0.00 | 12.00 | 0.00 | 1.00 | 3.00 | |
| Hours Spent in 1st Yr. | All | 650 | 1530 | 2506 | 600 | 0.00 | 27000 | 150 | 600 | 2000 | NS |
| | Male | 396 | 1625 | 2402 | 692 | 0.00 | 20480 | 200 | 692 | 2080 | |
| | Female | 255 | 1383 | 2657 | 480 | 0.00 | 27000 | 100 | 480 | 1632 | |
| Log Hours Spent in 1st Yr. | All | 645 | 6.14 | 1.89 | 6.40 | 0.00 | 10.20 | 5.02 | 6.40 | 7.60 | * |
| | Male | 392 | 6.29 | 1.87 | 6.54 | 0.00 | 9.93 | 5.30 | 6.54 | 7.64 | |
| | Female | 253 | 5.92 | 1.90 | 6.18 | 0.00 | 10.20 | 4.62 | 6.18 | 7.40 | |
| Work Days Last Week | All | 464 | 5.12 | 1.49 | 5.00 | 0.00 | 7.00 | 5.00 | 5.00 | 6.00 | ** |
| | Male | 279 | 5.27 | 1.42 | 5.00 | 0.00 | 7.00 | 5.00 | 5.00 | 6.00 | |
| | Female | 186 | 4.89 | 1.58 | 5.00 | 0.00 | 7.00 | 4.00 | 5.00 | 6.00 | |
| Days off Last Month | All | 431 | 7.04 | 5.30 | 6.00 | 0.00 | 31.00 | 4.00 | 6.00 | 9.00 | ** |
| | Male | 263 | 6.43 | 4.57 | 5.00 | 0.00 | 30.00 | 4.00 | 5.00 | 8.00 | |
| | Female | 168 | 8.00 | 6.17 | 8.00 | 0.00 | 31.00 | 4.00 | 8.00 | 10.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Venture Size

Table 12 shows the size variables. Before summarizing the comparison of the size of the ventures started by male and female entrepreneurs, two observations about the overall sample are important to make. First, as one might expect, the measures of venture size reported by the respondents are highly varied. For example, the amount of owner investment in the businesses ranges from a low of zero to a high of \$3.1 million, and the amount of money that the respondent estimates that it would take for the venture to become self-sustaining ranges from a low of zero to a high of \$50 million. The highly skewed nature of venture size suggests that examination of the median values, the distributions of the responses, and the natural log of the values might be more informative than examination of the raw numbers.

Second, as one also might expect, the size of the typical venture is very small. The median amount of owner investment in the businesses is \$2,771 and even the 75th percentile is only \$10,000. The median amount of money needed to make the businesses self-sustaining is only \$10,000, and the 75th percentile is only \$40,000.

The comparison of male and female entrepreneurs reveals no statistically significant difference in the expected amount of time that the respondent estimates that it will take for the venture to reach the break even point. Moreover, the distribution of responses on this measure is qualitatively the same for male and female entrepreneurs.

There are, however, statistically significant differences in the size of the owner investment and the amount of money that it will take for the business to become self-sustaining. In both cases, the natural log of the responses is higher for the male entrepreneurs. In addition, the variance on both measures is much higher for the male entrepreneurs than for the female entrepreneurs, suggesting that the differences between the two genders on these items is driven by a small number of very large ventures that are concentrated among male entrepreneurs.

Table 12. The Size of New Ventures Started by Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|------------------------|----------|-----|-----------|--------------------|----------|---------|--------------|-----------------------------|-----------------------------|-----------------------------|--------------|
| Owner Investment | All | 685 | \$23,274 | \$157,990 | \$2,771 | \$0 | \$3,105,000 | \$500 | \$2,770 | \$10,000 | NS |
| | Male | 417 | \$28,803 | \$192,115 | \$3,037 | \$0 | \$3,105,000 | \$500 | \$3,037 | \$12,000 | |
| | Female | 268 | \$14,666 | \$79,424 | \$2,000 | \$0 | \$1,065,000 | \$318 | \$2,000 | \$5,845 | |
| Log Owner Investment | All | 579 | 8.28 | 1.83 | 8.29 | 1.10 | 14.95 | 6.91 | 8.29 | 9.39 | ** |
| | Male | 360 | 8.46 | 1.85 | 8.52 | 3.00 | 14.95 | 7.24 | 8.52 | 9.62 | |
| | Female | 219 | 7.98 | 1.75 | 8.01 | 1.10 | 13.88 | 6.91 | 8.01 | 8.99 | |
| Break Even Amount | All | 481 | \$350,679 | \$2,957,306 | \$10,000 | \$0 | \$50,000,000 | \$3,300 | \$10,000 | \$40,000 | t |
| | Male | 314 | \$511,062 | \$3,627,164 | \$10,193 | \$0 | \$50,000,000 | \$4,760 | \$10,193 | \$50,000 | |
| | Female | 267 | \$39,932 | \$156,315 | \$5,000 | \$0 | \$1,500,000 | \$2,000 | \$5,000 | \$20,000 | |
| Log Break Even Amount | All | 479 | 2.46 | 2.84 | 9.21 | 0.00 | 17.73 | 8.10 | 9.21 | 10.60 | ** |
| | Male | 317 | 9.31 | 2.98 | 9.23 | 0.00 | 17.73 | 8.47 | 9.23 | 10.82 | |
| | Female | 162 | 8.51 | 2.48 | 8.52 | 0.00 | 14.22 | 7.60 | 8.52 | 9.90 | |
| Time to Break Even | All | 594 | 17.62 | 19.33 | 12.00 | 0.00 | 96.00 | 6.00 | 12.00 | 24.00 | NS |
| | Male | 371 | 18.36 | 19.83 | 12.00 | 0.00 | 96.00 | 6.00 | 12.00 | 24.00 | |
| | Female | 268 | 16.39 | 18.44 | 12.00 | 0.00 | 96.00 | 6.00 | 12.00 | 24.00 | |
| Log Time to Break Even | All | 594 | 2.46 | 1.00 | 2.56 | 0.00 | 4.57 | 1.95 | 2.56 | 3.21 | NS |
| | Male | 371 | 2.50 | 1.00 | 2.56 | 0.00 | 4.57 | 1.95 | 2.56 | 3.22 | |
| | Female | 223 | 2.39 | 1.00 | 2.56 | 0.00 | 4.57 | 1.95 | 2.56 | 3.22 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Type of Business Started

Table 13 shows the type of start-up variables. There are statistically significant differences between male and female entrepreneurs on the two measures of the technological intensity of the new ventures. Male entrepreneurs score higher than female entrepreneurs on the scale measuring the importance of technology to the start-up. In addition, male entrepreneurs are 22 percent more likely (45 percent versus 23 percent) to consider their businesses “high tech.” While the self-evaluations of the businesses as “high tech” may be biased upward, the gender gap in this measure suggests an underlying difference in the types of ventures founded by male and female entrepreneurs.

There were no statistically significant differences between male and female entrepreneurs in terms of having a competitive advantage or in terms of the sales accounted for by the three largest firms in their industry. However, female entrepreneurs indicated that they would face a lower level of competition than male entrepreneurs, a difference that is statistically significant.

In addition, female entrepreneurs indicated that they would lose their competitive advantage more slowly than male entrepreneurs, a difference that is also statistically significant. Female entrepreneurs indicated that they would lose their competitive advantage in an average of 90.11 months, as compared to 56.90 months for males. The greater variance in the responses of the female entrepreneurs, and the much higher estimates of the respondents in the top 75th percentile, combined with the same median value indicates that it is a difference in the respondents who believe that their venture will maintain a competitive advantage for a long time that accounts for this difference. Because the respondents who indicated that they would never lose their competitive advantage were recoded as having their competitive advantage for 240 months, it appears that it is these respondents who account for this difference between male and female entrepreneurs. (However, recoding the respondents who indicated that they would never lose their competitive advantage as having that advantage for 80 months reveals similar statistically significant differences between male and female entrepreneurs.)

Male entrepreneurs indicated that a lower percentage of their customers would be within 20 miles of their location three to four years after their businesses became operational and a higher percentage of their customers would be in the United States, but more than 100 miles from their location, or outside the United States, and these differences were statistically significant. There was no statistically significant difference between male and female entrepreneurs in terms of the proportion of customers that would be between 20 and 100 miles of their location three to four years after their businesses became operational.

Table 13. The Type of Ventures Founded by Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|-------------------------------------|----------|-----|-------|--------------------|--------|---------|---------|-----------------|-----------------------------|-----------------------------|--------------|
| Technology | | | | | | | | | | | |
| Technology Scale | | | | | | | | | | | |
| | All | 580 | 7.74 | 2.56 | 8.00 | 3.00 | 12.00 | 6.00 | 8.00 | 10.00 | ** |
| | Male | 357 | 7.99 | 2.47 | 9.00 | 3.00 | 12.00 | 6.00 | 9.00 | 10.00 | |
| | Female | 223 | 7.33 | 2.65 | 8.00 | 3.00 | 12.00 | 5.00 | 8.00 | 9.00 | |
| Hi-Tech | | | | | | | | | | | |
| | All | 665 | 36.0% | 48.0% | | | | | | | **** |
| | Male | 409 | 45.0% | 50.0% | | | | | | | |
| | Female | 256 | 23.0% | 42.0% | | | | | | | |
| Competition Months | | | | | | | | | | | |
| Competitive Advantage | | | | | | | | | | | |
| | All | 592 | 69.65 | 102.24 | 12.00 | 0.00 | 240.00 | 3.00 | 12.00 | 240.00 | **** |
| | Male | 365 | 56.90 | 93.98 | 12.00 | 0.00 | 240.00 | 3.00 | 12.00 | 24.00 | |
| | Female | 228 | 90.11 | 111.45 | 12.00 | 0.00 | 240.00 | 4.00 | 12.00 | 240.00 | |
| Unique Advantage | | | | | | | | | | | |
| | All | 676 | 81.0% | 40.0% | | | | | | | NS |
| | Male | 415 | 82.0% | 38.0% | | | | | | | |
| | Female | 262 | 78.0% | 42.0% | | | | | | | |
| Level of Competition | | | | | | | | | | | |
| | All | 682 | 2.01 | 0.83 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | * |
| | Male | 415 | 2.06 | 0.84 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | |
| | Female | 266 | 1.93 | 0.81 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | |
| Sales Top 3 Competitors | | | | | | | | | | | |
| | All | 389 | 46.04 | 38.83 | 50.00 | 0.00 | 100.00 | 5.50 | 50.00 | 80.00 | NS |
| | Male | 249 | 49.01 | 36.43 | 50.00 | 0.00 | 100.00 | 10.00 | 50.00 | 80.00 | |
| | Female | 139 | 40.72 | 37.06 | 36.00 | 0.00 | 100.00 | 0.00 | 36.00 | 75.00 | |
| Locus of Customers | | | | | | | | | | | |
| Customer <20 Miles | | | | | | | | | | | |
| | All | 672 | 60.36 | 34.80 | 70.00 | 0.00 | 100.00 | 25.00 | 70.00 | 90.00 | **** |
| | Male | 409 | 55.81 | 35.37 | 60.00 | 0.00 | 100.00 | 20.00 | 60.00 | 90.00 | |
| | Female | 262 | 67.45 | 32.71 | 75.00 | 0.00 | 100.00 | 50.00 | 75.00 | 100.00 | |
| Customer 20-100 Miles | | | | | | | | | | | |
| | All | 540 | 26.91 | 23.53 | 20.00 | 0.00 | 100.00 | 10.00 | 20.00 | 35.00 | |
| | Male | 342 | 26.10 | 23.34 | 20.00 | 0.00 | 100.00 | 10.00 | 20.00 | 30.00 | |
| | Female | 262 | 28.31 | 23.83 | 20.00 | 0.00 | 100.00 | 10.00 | 20.00 | 40.00 | |
| Customer in US >100 Miles | | | | | | | | | | | |
| | All | 538 | 21.88 | 26.64 | 10.00 | 0.00 | 100.00 | 0.00 | 10.00 | 30.00 | **** |
| | Male | 343 | 25.46 | 31.36 | 10.00 | 0.00 | 100.00 | 0.00 | 10.00 | 43.00 | |
| | Female | 195 | 15.58 | 25.21 | 5.00 | 0.00 | 100.00 | 0.00 | 5.00 | 20.00 | |
| Customer Outside U.S. | | | | | | | | | | | |
| | All | 461 | 3.52 | 9.86 | 0.00 | 0.00 | 70.00 | 0.00 | 0.00 | 1.00 | *** |
| | Male | 279 | 4.54 | 11.45 | 0.00 | 0.00 | 70.00 | 0.00 | 0.00 | 2.00 | |
| | Female | 182 | 1.95 | 6.46 | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Expectations for Venture Performance

Table 14 shows the expectations variables. Before summarizing the comparison of the expectations of male and female entrepreneurs, three observations about the overall sample are important to make. First, the expectations of the typical entrepreneur are not very large. The median expected first-year income is \$30,000, and the median expected fifth-year income is only \$100,000. Similarly, the median expected first-year employment is three people and the median expected fifth-year employment is six.

Second, the expectations of the typical entrepreneur are highly over optimistic, which we can see by comparing the actual employment of the entrepreneurs to their expected employment. The sampled entrepreneurs had a median of zero employees at the end of the four-year observation period. This value is far below the median values expected at one and five years of three and six employees, respectively.

Third, the expectations of the entrepreneurs vary a great deal. For instance, the expected fifth-year income of the respondents ranged from zero to \$80 million and the expected fifth-year employment ranged from zero to 3,500 employees. The extreme values on the expectations measures suggest the importance of examining the medians and the natural log of the values.

Male entrepreneurs have consistently higher expectations for their businesses than female entrepreneurs, and these differences are statistically significant. They have higher first- and fifth-year income expectations, with medians of \$50,000 versus \$30,000 for the first year, and \$150,000 versus \$60,000 for the fifth year. They also have higher first- and fifth-year employment expectations, with medians of 3 employees versus 2 employees for the first-year, and 7.5 employees versus 5 employees for the fifth-year. Finally, male entrepreneurs offer higher odds that their ventures will be the primary source of household income, with a median of 80 percent for men versus 60 percent for women.

The much higher ranges and standard deviations in the responses of male entrepreneurs on the first and fifth-year income variables and the first-year employment variables suggest that a small number of male entrepreneurs with very high expectations for their businesses account for these differences.

Table 14. The Income and Employment Expectations of Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|---------------|----------|-----|-------------|--------------------|-----------|-----------|--------------|-----------------------------|-----------------------------|-----------------------------|--------------|
| 1st Year | All | 579 | \$386,658 | \$2,617,554 | \$30,000 | -\$25,000 | \$45,000,000 | \$10,000 | \$30,000 | \$100,000 | * |
| Income | Male | 362 | \$570,061 | \$3,288,316 | \$50,000 | -\$25,000 | \$45,000,000 | \$15,000 | \$50,000 | \$200,000 | |
| | Female | 217 | \$80,311 | \$321,408 | \$20,000 | -\$7,000 | \$3,000,000 | \$9,650 | \$20,000 | \$50,000 | |
| Ln First Year | All | 575 | 10.39 | 2.28 | 10.31 | 0.00 | 17.62 | 9.39 | 10.31 | 11.51 | **** |
| Income | Male | 359 | 10.76 | 2.44 | 10.82 | 0.00 | 17.62 | 9.62 | 10.82 | 12.21 | |
| | Female | 216 | 9.77 | 1.85 | 9.90 | 0.00 | 4.91 | 9.21 | 9.90 | 10.82 | |
| 5th Year | All | 565 | \$1,585,523 | \$7,345,665 | \$100,000 | \$0 | \$80,000,000 | \$45,000 | \$100,000 | \$400,000 | ** |
| Income | Male | 357 | \$2,307,490 | \$8,993,402 | \$150,000 | \$0 | \$80,000,000 | \$52,000 | \$150,000 | \$750,000 | |
| | Female | 208 | \$346,771 | \$2,343,566 | \$60,000 | \$0 | \$30,000,000 | \$28,800 | \$60,000 | \$125,000 | |
| Ln 5th Year | All | 565 | 11.73 | 2.23 | 11.51 | 0.00 | 18.20 | 10.74 | 11.51 | 12.90 | **** |
| Income | Male | 357 | 12.13 | 2.43 | 11.92 | 0.00 | 18.20 | 10.98 | 11.92 | 13.53 | |
| | Female | 208 | 11.04 | 1.61 | 11.00 | 0.00 | 17.22 | 10.27 | 11.00 | 11.87 | |
| 1st Year | All | 380 | 18.93 | 254.18 | 3.00 | 0.00 | 5000.00 | 0.50 | 3.00 | 6.00 | NS |
| Employment | Male | 254 | 25.93 | 310.92 | 3.00 | 0.00 | 5000.00 | 1.00 | 3.00 | 6.00 | |
| | Female | 126 | 4.87 | 10.68 | 2.00 | 0.00 | 75.00 | 0.50 | 2.00 | 5.00 | |
| Ln 1st Year | All | 384 | 1.35 | 1.05 | 1.39 | 0.00 | 8.52 | 0.41 | 1.39 | 1.95 | * |
| Employment | Male | 256 | 1.44 | 1.08 | 1.39 | 0.00 | 8.52 | 0.69 | 1.39 | 1.95 | |
| | Female | 127 | 1.17 | 0.95 | 1.10 | 0.00 | 4.33 | 0.41 | 1.10 | 1.73 | |
| 5th Year | All | 364 | 29.84 | 176.72 | 6.00 | 0.00 | 3500.00 | 3.00 | 6.00 | 15.00 | NS |
| Employment | Male | 242 | 22.58 | 56.98 | 7.50 | 0.00 | 525.00 | 3.00 | 7.00 | 22.00 | |
| | Female | 122 | 44.15 | 293.81 | 5.00 | 0.00 | 3500.00 | 2.00 | 5.00 | 11.00 | |
| Ln 5th Year | All | 367 | 2.16 | 1.21 | 1.95 | 0.00 | 8.16 | 1.39 | 1.95 | 2.77 | * |
| Employment | Male | 244 | 2.27 | 1.19 | 2.14 | 0.00 | 6.27 | 1.39 | 2.14 | 3.14 | |
| | Female | 124 | 1.94 | 1.21 | 1.79 | 0.00 | 8.16 | 1.10 | 1.79 | 2.49 | |
| Odds | All | 677 | 64.70 | 33.31 | 70.00 | 0.00 | 100.00 | 50.00 | 70.00 | 100.00 | *** |
| Primary | Male | 414 | 68.22 | 32.27 | 80.00 | 0.00 | 100.00 | 50.00 | 80.00 | 100.00 | |
| | Female | 261 | 59.17 | 34.21 | 60.00 | 0.00 | 100.00 | 30.00 | 60.00 | 100.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Risk Preferences

Table 15 shows the risk preference variables. This table indicates that male entrepreneurs assess a significantly higher probability (61.24 percent versus 56.78 percent) that new businesses started today will be alive in five years. However, there is no statistically significant difference across genders in the odds given by the founder that his or her venture will be alive in five years. As a result, the gap in the odds of survival between own and other businesses offered by male entrepreneurs is smaller, on average, than that offered by female entrepreneurs, perhaps suggesting that male entrepreneurs prefer to start riskier businesses than female entrepreneurs.

In addition, when asked to choose between businesses with low or high risk-to-return ratios, female entrepreneurs were 18 percent more likely to chose the low risk-return businesses, a difference that is statistically significant.

Table 15. The Risk Preferences of Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|----------------------------|----------|-----|-------|-----------------------|--------|---------|---------|--------------------------------|--------------------------------|--------------------------------|--------------|
| Odds Alive in 5 Yrs. | All | 665 | 81.37 | 25.03 | 92.00 | 0.00 | 100.00 | 70.00 | 92.00 | 100.00 | NS |
| | Male | 407 | 81.03 | 25.40 | 92.00 | 0.00 | 100.00 | 70.00 | 92.00 | 100.00 | |
| | Female | 257 | 81.89 | 24.46 | 91.49 | 0.00 | 100.00 | 70.00 | 91.00 | 100.00 | |
| Prefer Low Risk/Return | All | 478 | 81.0% | 39.0% | | | | | | | **** |
| | Male | 284 | 74.0% | 44.0% | | | | | | | |
| | Female | 194 | 92.0% | 28.0% | | | | | | | |
| Pct. Starts Alive in 5Yrs. | All | 439 | 59.50 | 21.85 | 60.00 | 0.00 | 100.00 | 50.00 | 60.00 | 80.00 | * |
| | Male | 267 | 61.24 | 21.59 | 61.00 | 0.00 | 98.00 | 50.00 | 61.00 | 80.00 | |
| | Female | 172 | 56.78 | 22.06 | 60.00 | 0.00 | 100.00 | 50.00 | 60.00 | 75.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Opportunity Identification

Table 16 shows the opportunity identification variables. The table shows a wide range of differences in the nature of opportunity identification by male and female entrepreneurs. Male entrepreneurs score higher on the scale that indicates the use of search processes to identify opportunities and the scale that indicates that opportunities identification is dependent on action. Both of these differences are statistically significant. In addition, male entrepreneurs examine more ideas and gather more new information in the process of identifying their business ideas than female entrepreneurs, differences that are also statistically significant. Finally, although there is no statistically significant difference in the importance of gathering information on the odds of the downside outcome occurring when choosing between opportunities, male entrepreneurs are significantly more likely to consider it important to gather information on the odds of the upside and significantly less likely to consider it important to gather information on the amount of the upside when choosing between opportunities.

Table 16. Opportunity Identification by Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|------------------|----------|-----|-------|--------------------|--------|---------|---------|-----------------------------|-----------------------------|-----------------------------|--------------|
| Search Scale | All | 471 | 11.68 | 3.39 | 12.00 | 4.00 | 20.00 | 9.00 | 12.00 | 14.00 | * |
| | Male | 281 | 11.96 | 3.29 | 12.00 | 4.00 | 20.00 | 10.00 | 12.00 | 14.00 | |
| | Female | 189 | 11.26 | 3.51 | 11.00 | 4.00 | 20.00 | 9.00 | 11.00 | 14.00 | |
| Action Scale | All | 473 | 7.72 | 2.95 | 8.00 | 3.00 | 15.00 | 5.00 | 8.00 | 10.00 | *** |
| | Male | 282 | 8.18 | 2.91 | 8.00 | 3.00 | 15.00 | 6.00 | 8.00 | 10.00 | |
| | Female | 192 | 7.05 | 2.88 | 7.00 | 3.00 | 15.00 | 5.00 | 7.00 | 9.00 | |
| Number of Ideas | All | 455 | 3.27 | 2.08 | 3.00 | 1.00 | 9.00 | 1.00 | 3.00 | 5.00 | **** |
| | Male | 274 | 3.62 | 2.21 | 3.00 | 1.00 | 9.00 | 2.00 | 3.00 | 5.00 | |
| | Female | 181 | 2.74 | 1.75 | 2.00 | 1.00 | 9.00 | 1.00 | 2.00 | 4.00 | |
| Amount New Info | All | 476 | 1.90 | 0.86 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | *** |
| | Male | 183 | 2.00 | 0.73 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | |
| | Female | 193 | 1.75 | 0.85 | 2.00 | 0.00 | 3.00 | 1.00 | 2.00 | 3.00 | |
| Odds of Upside | All | 479 | 2.33 | 0.70 | 2.00 | 1.00 | 3.00 | 2.00 | 2.00 | 3.00 | t |
| | Male | 284 | 2.38 | 0.69 | 2.00 | 1.00 | 3.00 | 2.00 | 2.00 | 3.00 | |
| | Female | 195 | 2.27 | 0.73 | 2.00 | 1.00 | 3.00 | 2.00 | 2.00 | 3.00 | |
| Amount of Upside | All | 479 | 2.42 | 0.68 | 3.00 | 2.00 | 3.00 | 2.00 | 3.00 | 3.00 | ** |
| | Male | 284 | 2.35 | 0.73 | 3.00 | 1.00 | 3.00 | 2.00 | 3.00 | 3.00 | |
| | Female | 195 | 2.53 | 0.59 | 3.00 | 1.00 | 3.00 | 2.00 | 3.00 | 3.00 | |
| Odds of downside | All | 479 | 2.63 | 0.63 | 3.00 | 1.00 | 3.00 | 2.00 | 3.00 | 3.00 | NS |
| | Male | 284 | 2.60 | 0.65 | 3.00 | 1.00 | 3.00 | 2.00 | 3.00 | 3.00 | |
| | Female | 195 | 2.68 | 0.59 | 3.00 | 1.00 | 3.00 | 2.00 | 3.00 | 3.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Confidence in Venture Organizing Abilities

Table 17 shows the confidence in venture organizing variables. The table indicates that of the nine different dimensions of the entrepreneur's confidence in his or her ability to organize the venture that were examined, there is only one on which a statistically significant difference between male and female entrepreneurs exists. Male entrepreneurs are significantly more likely than female entrepreneurs to have confidence in their ability to attract employees to their new venture. There is no difference across gender in the entrepreneurs' confidence in their ability to attract start-up or working capital, deal with distributors, attract customers, obtain raw materials, compete with other firms, comply with laws and regulations, or keep up with technology.

Table 17. Confidence in Venture Organizing of Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|-------------------------|----------|-----|------|--------------------|--------|---------|---------|-----------------------------|-----------------------------|-----------------------------|--------------|
| Start-up Capital | All | 398 | 3.15 | 1.17 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | NS |
| | Male | 251 | 3.14 | 1.20 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 146 | 3.18 | 1.11 | 3.00 | 1.00 | 5.00 | 3.00 | 3.00 | 4.00 | |
| Working Capital | All | 416 | 3.29 | 1.07 | 3.00 | 1.00 | 5.00 | 3.00 | 3.00 | 4.00 | NS |
| | Male | 260 | 3.28 | 1.10 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 156 | 3.30 | 1.03 | 3.00 | 1.00 | 5.00 | 3.00 | 3.00 | 4.00 | |
| Deal with Distributors | All | 349 | 4.08 | 0.91 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | NS |
| | Male | 217 | 4.11 | 0.92 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| | Female | 131 | 4.04 | 0.88 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| Attract Customers | All | 464 | 4.12 | 0.86 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | NS |
| | Male | 276 | 4.11 | 0.87 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| | Female | 188 | 4.13 | 0.84 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| Attract Employees | All | 308 | 3.72 | 1.06 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | * |
| | Male | 197 | 3.81 | 1.03 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |
| | Female | 112 | 3.56 | 1.09 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 4.00 | |
| Obtain Raw Materials | All | 150 | 4.12 | 4.12 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | NS |
| | Male | 85 | 4.06 | 0.99 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| | Female | 66 | 4.20 | 0.90 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | |
| Compete | All | 434 | 3.93 | 0.91 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | NS |
| | Male | 262 | 3.97 | 0.91 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |
| | Female | 172 | 3.87 | 0.91 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |
| Comply with Laws | All | 433 | 4.39 | 0.82 | 5.00 | 1.00 | 5.00 | 4.00 | 5.00 | 5.00 | NS |
| | Male | 258 | 4.39 | 0.81 | 5.00 | 1.00 | 5.00 | 4.00 | 5.00 | 5.00 | |
| | Female | 175 | 4.38 | 0.82 | 5.00 | 1.00 | 5.00 | 4.00 | 5.00 | 5.00 | |
| Keep up with Technology | All | 383 | 4.20 | 0.96 | 4.00 | 1.00 | 5.00 | 4.00 | 4.00 | 5.00 | NS |
| | Male | 234 | 4.25 | 0.96 | 5.00 | 1.00 | 5.00 | 4.00 | 5.00 | 5.00 | |
| | Female | 149 | 4.11 | 0.95 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

Start-up Problems

Table 18 shows the start-up problem variables. The table indicates that there are no statistically significant differences between male and female entrepreneurs in terms of balancing time between work and personal and family life, or in getting health insurance for the entrepreneur and his or her family. However, male entrepreneurs did indicate that they face greater problems than female entrepreneurs in being taken seriously as business people, receiving support for their entrepreneurial efforts from family and friends, and

with the lack of mentors to help them to develop their businesses.¹ All of these differences are statistically significant.

Table 18. The Start-up Problems of Male and Female Entrepreneurs.

| | Category | N | Mean | Standard Deviation | Median | Minimum | Maximum | 25 th Percentile | 50 th Percentile | 75 th Percentile | Significance |
|-------------------|----------|-----|------|--------------------|--------|---------|---------|-----------------------------|-----------------------------|-----------------------------|--------------|
| Balancing Time | All | 475 | 3.69 | 1.14 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | NS |
| | Male | 283 | 3.75 | 1.11 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |
| | Female | 192 | 3.61 | 1.18 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 | |
| Taken Seriously | All | 476 | 3.06 | 1.19 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | t |
| | Male | 283 | 3.14 | 1.19 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 193 | 2.95 | 1.18 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| Receiving Support | All | 475 | 3.00 | 1.47 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | t |
| | Male | 283 | 3.11 | 1.43 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 192 | 2.85 | 1.51 | 3.00 | 1.00 | 5.00 | 1.00 | 3.00 | 4.00 | |
| Lack of Mentors | All | 475 | 3.14 | 1.26 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | *** |
| | Male | 283 | 3.32 | 1.24 | 4.00 | 1.00 | 5.00 | 2.00 | 4.00 | 4.00 | |
| | Female | 193 | 2.88 | 1.24 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| Health Insurance | All | 467 | 3.25 | 1.35 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | NS |
| | Male | 281 | 3.19 | 1.35 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |
| | Female | 186 | 3.09 | 1.36 | 3.00 | 1.00 | 5.00 | 2.00 | 3.00 | 4.00 | |

Note: NS= Not significant; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

IV.2 Regression Analysis

The significant differences between male and female entrepreneurs reported in the previous section might represent actual gender differences or they might be an artifact of other differences that are correlated with gender. To increase our confidence that these differences represent gender effects rather than other factors, we examine regressions to predict the measures of entrepreneurial activity for which significant differences were found, in which we control for these other factors. We begin with performance outcomes.

IV.2.a Performance Outcomes

In the bivariate analysis, we found one statistically significant difference between male and female entrepreneurs in performance outcomes – the greater likelihood of male-led new ventures to become employer firms during the four-year observation period of the study. Table 19 shows the effects of gender on the likelihood that a new venture becomes an employer firm in a logistic regression that includes the control variables. The table shows that the effect of gender on the tendency of a venture to become an employer firm

¹ Note that these are perceived problems.

no longer exists after the control variables are included. Thus, we infer that the uncontrolled gender effect was an artifact of the correlation between gender and at least one of the control variables.

Table 19. Multiple Regression to Predict the Effect of Gender on the Likelihood of Becoming an Employer Firm.

| Variable | Business files for unemployment insurance within 4 years | Exp(B) | |
|---|--|--------------|------|
| Male | | 1.326 | |
| Age | | 1.008 | |
| Married | | 1.060 | |
| Number of Household Members | | 1.253 | |
| Log of Household Net Worth | | 1.023 | |
| White | | 0.363 | |
| Black | | 0.125 | |
| Hispanic | | 0.698 | |
| Working Part Time Before Start | | 0.859 | |
| Retired Before Start | | 1.568 | |
| Not Employed Before Start | | 0.716 | |
| Homemaker | | 0.815 | |
| Managing Business Owned by Others | | 1.629 | |
| Largest Number of People Supervised | | 1.000 | |
| Number of Prior Start-ups | | 1.083 | |
| Years of Industry Experience | | 1.026 | |
| County Residential Tenure (Months) | | 0.999 | |
| Parents Self-Employed/ Business Owners | | 0.642 | ** |
| Purchased Business | | 2.408 | |
| Franchise | | 0.911 | |
| Sponsored Business | | 2.135 | |
| High School Dropout | | 0.111 | |
| High School Graduate | | 0.566 | |
| Post High School Education | | 0.819 | t |
| College Graduate | | 0.799 | |
| Sector Dummies | Yes | | Sig. |
| Constant | Yes | | Sig. |
| N | | 385 | |
| Adjusted R-square/ Cox & Snell R-Square | | 0.196 | |
| F-Value/ Chi-Square | | 85.588 | **** |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.b Motivations for Starting the Business

In the bivariate analysis, we found four statistically significant differences between male and female entrepreneurs in the motivations that they had for starting their businesses: the scale that measured the

entrepreneur's motivation to make money; the scale that measured the entrepreneur's motivation for a flexible work arrangement; a single item that measured the importance of owning a business relative to spending time with one's family; and a single item that measured the belief that business owners are community leaders.

Table 20 shows the effects of gender on these four motivations in regressions that include the control variables. While the effect of gender on the scale measuring the motivation for flexible work arrangements is no longer statistically significant once the control variables are included in the regression analysis, the three other measures are robust to their inclusion. Being male has a statistically significant positive effect on the motivation to start a business to make money ($\beta = 0.165, p < 0.01$). It also has a statistically significant positive effect on the belief that owning a business is more important than spending time with one's family ($\beta = 0.118, p < 0.10$). Finally, it has a statistically significant positive effect on the belief that business owners are community leaders ($\beta = 0.163, p < 0.05$).

Table 20. Multiple Regression to Predict the Effect of Gender on Entrepreneurial Motivations.

| Variable | To make money | | For flexibility and independence | | Owning Business More Important than Time With Family | | Community leaders own their own businesses | |
|-------------------------------------|---------------|-----------------|----------------------------------|--------------|--|----------------|--|----------------|
| | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value |
| Male | 0.165 | 2.606 ** | 0.034 | 0.508 | 0.118 | 1.856 t | 0.163 | 2.474 * |
| Age | -0.246 | -3.661 **** | -0.174 | -2.446 ** | 0.158 | 2.309 * | 0.021 | 0.300 |
| Married | 0.052 | 0.797 | 0.017 | 0.244 | -0.117 | -1.784 t | -0.067 | -0.986 |
| Number of Household Members | 0.053 | 0.816 t | -0.090 | -0.132 | -0.032 | -0.482 | 0.103 | 1.518 |
| Log of Household Net Worth | -0.071 | -1.066 | -0.109 | -1.560 | 0.036 | 0.530 | 0.081 | 1.168 |
| White | -0.137 | -0.779 | -0.034 | -0.180 | -0.105 | -0.590 | 0.025 | 0.132 |
| Black | -0.035 | -0.235 | 0.017 | 0.104 | -0.035 | -0.228 | -0.030 | -0.191 |
| Hispanic | -0.058 | -0.450 | -0.050 | -0.370 | -0.104 | -0.819 | 0.104 | 0.770 |
| Working Part Time Before Start | 0.028 | 0.456 | 0.011 | 0.164 | 0.008 | 0.133 | 0.021 | 0.318 |
| Retired Before Start | 0.021 | 0.340 | -0.001 | -0.021 | -0.060 | -0.959 | -0.040 | -0.613 |
| Not Employed Before Start | 0.089 | 1.486 | 0.045 | 0.716 | 0.041 | 0.686 | 0.073 | 1.165 |
| Homemaker | 0.003 | 0.051 | 0.129 | 1.900 t | -0.118 | -1.810 t | -0.061 | -0.905 |
| Managing Business Owned by Others | 0.093 | 1.571 | 0.115 | 1.861 t | 0.079 | 1.330 | -0.044 | -0.708 |
| Largest Number of People Supervised | -0.005 | -0.079 | 0.010 | 0.153 | -0.104 | -1.712 t | -0.012 | -0.186 |
| Number of Prior Start-ups | 0.163 | 2.465 * | 0.060 | 0.873 | 0.169 | 2.562 * | -0.071 | -1.031 |
| Years of Industry Experience | 0.036 | 0.566 | 0.069 | 1.048 | 0.117 | 1.825 t | 0.005 | 0.071 |
| County Residential Tenure (Months) | -0.084 | -1.339 | -0.064 | -0.964 | -0.042 | -0.672 | 0.096 | 1.462 |
| Parents Self-Employed/ Business Own | -0.043 | -0.705 | 0.028 | 0.432 | 0.053 | 0.854 | -0.023 | -0.363 |
| Purchased Business | 0.007 | 0.117 | 0.009 | 0.148 | 0.029 | 0.491 | 0.059 | 0.947 |
| Franchise | 0.178 | 3.049 **** | 0.029 | 0.470 | -0.032 | -0.542 | -0.033 | -0.533 |
| Sponsored Business | -0.119 | 1.924 t | -0.117 | -1.815 t | -0.038 | 0.601 | -0.032 | -0.494 |
| High School Dropout | 0.081 | 1.188 | -0.030 | -0.418 | 0.059 | 0.869 | 0.055 | 0.764 |
| High School Graduate | 0.135 | 1.521 | -0.040 | -0.421 | 0.099 | 1.098 | 0.019 | 0.205 |
| Post High School Education | 0.213 | 2.320 * | -0.119 | -1.232 | -0.006 | -0.063 | 0.175 | 1.817 t |
| College Graduate | 0.118 | 1.375 * | -0.109 | -1.210 | 0.093 | 1.080 | 0.098 | 1.087 |
| Sector Dummies | Yes | Sig. | Yes | NS | Yes | NS | | |
| Constant | Yes | Sig. | Yes | Sig. | Yes | NS | | |
| N | 285 | | | | 288 | | 293 | |
| Adjusted R-square | 0.123 | | 0.018 | | 0.109 | | 0.02 | |
| F-Value | 2.213 | | 1.160 | | 2.063 | | 1.177 | |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.c Effort Expended to Develop the Business

In the bivariate analysis, we found three statistically significant differences between male and female entrepreneurs in effort – male entrepreneurs spent more hours on their ventures in the first year of the start-up, had fewer days off in the previous month, and worked more days in the previous week. Table 21 shows the effects of gender on the effort made by entrepreneurs to develop their new ventures in regressions that include the control variables. The table shows that the effect of gender on entrepreneurial effort is no longer significant after the control variables are included in the regression analysis. Thus, we infer that the uncontrolled gender effect on effort was an artifact of the correlation between gender and at least one of the control variables.

Table 21. Multiple Regression to Predict the Effect of Gender on Entrepreneurial Effort.

| Variable | Log hours spent on venture in first year | | Number of days off in previous month | | Number of work days in previous week | | |
|---|--|--------------|--------------------------------------|---------------|--------------------------------------|--------------|------|
| | Beta | t-value | Beta | t-value | Beta | t-value | |
| Male | 0.067 | 1.198 | -0.111 | -1.595 | 0.061 | 0.902 | |
| Age | -0.128 | -2.139 * | -0.033 | -0.435 | 0.043 | 0.588 | |
| Married | 0.016 | 0.273 | 0.007 | 0.092 | 0.001 | 0.018 | |
| Number of Household Members | -0.045 | -0.750 | -0.080 | -1.103 | 0.039 | 0.554 | |
| Log of Household Net Worth | 0.020 | 0.336 | -0.198 | -2.642 ** | 0.047 | 0.638 | |
| White | 0.153 | 1.124 | 0.092 | 0.483 | 0.028 | 0.149 | |
| Black | 0.063 | 0.543 | 0.028 | 0.173 | -0.006 | -0.039 | |
| Hispanic | 0.060 | 0.599 | 0.051 | 0.364 | -0.033 | -0.239 | |
| Working Part Time Before Start | 0.009 | 0.162 | 0.014 | 0.209 | -0.063 | -0.948 | |
| Retired Before Start | 0.000 | -0.004 | 0.170 | 2.423 * | -0.154 | -2.274 * | |
| Not Employed Before Start | -0.014 | -0.253 | 0.090 | 1.346 | -0.133 | -2.055 * | |
| Homemaker | 0.066 | 1.150 | 0.069 | 0.954 | -0.015 | -0.208 | |
| Managing Business Owned by Others | 0.014 | 0.262 | -0.031 | -0.463 | 0.034 | 0.535 | |
| Largest Number of People Supervised | 0.035 | 0.604 | 0.011 | 0.166 | 0.061 | 0.934 | |
| Number of Prior Start-ups | 0.101 | 1.750 t | 0.079 | 1.088 | 0.038 | 0.530 | |
| Years of Industry Experience | 0.163 | 2.825 ** | -0.015 | -0.217 | 0.003 | 0.048 | |
| County Residential Tenure (Months) | -0.036 | -0.651 | 0.055 | 0.777 | -0.089 | -1.301 | |
| Parents Self-Employed/ Business Owners | 0.025 | 0.463 | 0.003 | 0.046 | 0.028 | 0.424 | |
| Purchased Business | -0.008 | -0.155 | -0.023 | -0.348 | 0.085 | 1.314 | |
| Franchise | -0.068 | -1.293 | -0.054 | -0.824 | 0.064 | 1.004 | |
| Sponsored Business | -0.160 | -2.863 ** | 0.060 | 0.859 | 0.001 | 0.009 | |
| High School Dropout | -0.017 | -0.283 | -0.050 | -0.684 | 0.038 | 0.530 | |
| High School Graduate | -0.063 | -0.813 | -0.128 | -1.268 | 0.060 | 0.616 | |
| Post High School Education | -0.082 | -1.015 | 0.023 | 0.225 | 0.037 | 0.377 | |
| College Graduate | -0.144 | -1.890 t | -0.030 | -0.315 | 0.054 | 0.584 | |
| Sector Dummies | Yes | | Sig. | Yes | NS | Yes | NS |
| Constant | Yes | | Sig. | Yes | Sig. | Yes | Sig. |
| N | 379 | | 266 | | 281 | | |
| Adjusted R-square/ Cox & Snell R-Square | 0.043 | | -0.007 | | -0.007 | | |
| F-Value/ Chi-Square | 1.514 | | 0.941 | | 0.939 | | |

Note: NS= Not significant; Sig. = significant at the p< 0.05 level; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

IV.2.d Size of the Ventures

In the bivariate analysis, we found two statistically significant differences between male and female entrepreneurs in the size of their ventures – male entrepreneurs invested more money in their ventures, and had ventures with a higher amount of investment before they would become self-sustaining. Table 22 shows the effects of gender on venture size in regressions that include the control variables. The table shows that the effect of gender on venture size is “driven away” by the inclusion of control variables. Thus, we conclude that the uncontrolled gender effect on effort was an artifact of the correlation between gender and at least one of the control variables.

Table 22. Multiple Regression to Predict the Effect of Gender on the Size of the Ventures.

| Variable | Log of the amount invested by owners | | Log of the break even level | |
|---|--------------------------------------|--------------|-----------------------------|--------------|
| | Beta | t-value | Beta | t-value |
| Male | 0.029 | 0.547 | 0.064 | 1.048 |
| Age | -0.051 | -0.880 | -0.034 | -0.525 |
| Married | 0.051 | 0.896 | -0.027 | -0.420 |
| Number of Household Members | -0.033 | -0.567 | 0.091 | 1.383 |
| Log of Household Net Worth | 0.122 | 2.219 * | 0.063 | 0.975 |
| White | 0.014 | 0.112 | -0.061 | -0.394 |
| Black | -0.087 | -0.765 | 0.016 | 0.123 |
| Hispanic | 0.073 | 0.772 | 0.018 | 0.153 |
| Working Part Time Before Start | -0.111 | -2.137 * | -0.024 | -0.394 |
| Retired Before Start | 0.067 | 1.241 | -0.059 | -0.940 |
| Not Employed Before Start | -0.137 | -2.693 ** | -0.089 | -1.537 |
| Homemaker | 0.019 | 0.355 | 0.053 | 0.862 |
| Managing Business Owned by Others | 0.026 | 0.518 | 0.044 | 0.741 |
| Largest Number of People Supervised | -0.036 | -0.657 | 0.009 | 0.145 |
| Number of Prior Start-ups | 0.224 | 4.056 **** | 0.324 | 5.077 **** |
| Years of Industry Experience | 0.191 | 3.344 **** | 0.083 | 1.288 |
| County Residential Tenure (Months) | -0.022 | -0.415 | -0.109 | -1.812 t |
| Parents Self-Employed/ Business Owners | 0.028 | 0.531 | 0.026 | 0.428 |
| Purchased Business | 0.089 | 1.697 t | 0.131 | 2.290 * |
| Franchise | -0.130 | -2.576 * | -0.089 | -1.547 |
| Sponsored Business | -0.029 | -0.556 | -0.032 | -0.509 |
| High School Dropout | -0.083 | -1.401 | -0.036 | -0.519 |
| High School Graduate | -0.016 | -0.221 | -0.036 | -0.414 |
| Post High School Education | -0.001 | -0.017 | 0.004 | 0.044 |
| College Graduate | -0.020 | -0.276 | -0.010 | -0.121 |
| Sector Dummies | Yes | NS | Yes | NS |
| Constant | Yes | Sig. | Yes | Yes |
| N | 347 | | 289 | |
| Adjusted R-square/ Cox & Snell R-Square | 0.207 | | 0.162 | |
| F-Value/ Chi-Square | 3.740 | **** | 2.690 | **** |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.e Type of Businesses Started

We examined three dimensions of the nature of the business: technological intensity, level of competition, and locus of customers. For expositional purposes, we present the regressions for technological intensity and level of competition in one table and those for the locus of customers in another.

In the bivariate analysis, we found two statistically significant differences between male and female entrepreneurs in terms of the technological intensity of their businesses – male entrepreneurs were more likely than female entrepreneurs to consider their businesses “high tech,” and they scored higher on the scale measuring the importance of technology to the start-up. Table 23 shows the effects of gender on technological intensity in regressions that include the control variables. The table shows that the effect of

gender on whether or not the respondent considers the venture to be “high tech” is robust to the inclusion of the control variables ($\exp(B) = 3.415$, $p < .0001$). The table also shows that the effect of gender on the importance of technology to the start-up scale is robust to the inclusion of the control variables ($\beta = 0.137$, $p < 0.05$).

We also examined the two measures of competition that were significant in the t-tests comparing male and female entrepreneurs – the level of competition that the entrepreneurs expected and the number of months before they expected to lose their competitive advantage. Table 23 also shows the effects of gender on these variables in regressions that include the control variables. While the table shows no significant differences between male and female entrepreneurs in the level of competition expected once the control variables are included in the regressions, the perceived longer time until the venture loses its competitive advantage remains statistically significant after the inclusion of the control variables.

Table 23. Multiple Regression to Predict Effect of Gender on the Technological Intensity and Competition Faced by Ventures.

| Variable | Consider business high tech | Importance of technology to start- up scale | | Level of Competition Expected | | Months before lose competitive advantage | |
|-----------------------------------|-----------------------------------|---|----------------|----------------------------------|----------------|--|-----------------|
| | <u>Exp(B)</u> | <u>Beta</u> | <u>t-value</u> | <u>Beta</u> | <u>t-value</u> | <u>Beta</u> | <u>t-value</u> |
| Male | 3.415 **** | 0.137 | 2.431 * | 0.026 | 0.448 | -0.139 | -2.381 * |
| Age | 0.984 | 0.003 | 0.047 | -0.063 | -1.038 | 0.098 | 1.614 |
| Married | 0.704 | -0.117 | -1.980 * | -0.061 | -1.025 | 0.076 | 1.262 |
| Number of Household Members | 0.913 | 0.055 | 0.917 | 0.010 | 0.256 | 0.042 | 0.688 |
| Log of Household Net Worth | 1.122 | 0.032 | 0.553 | 0.019 | 0.319 | -0.008 | -0.136 |
| White | 1.745 | -0.099 | -0.728 | 0.133 | 0.953 | 0.185 | 1.346 |
| Black | 1.760 | 0.016 | 0.137 | 0.169 | 1.403 | 0.053 | 0.446 |
| Hispanic | 2.033 | -0.076 | -0.757 | 0.034 | 0.326 | 0.060 | 0.576 |
| Working Part Time Before Start | 0.722 | -0.047 | -0.837 | -0.008 | -0.144 | 0.139 | 2.463 * |
| Retired Before Start | 3.240 t | 0.024 | 0.417 | -0.031 | -0.543 | -0.083 | -1.411 |
| Not Employed Before Start | 1.419 | 0.011 | 0.206 | 0.051 | 0.933 | -0.022 | -0.390 |
| Homemaker | 1.047 | 0.030 | 0.524 | -0.014 | -0.238 | -0.067 | -1.139 |
| Managing Bus. Owned by Others | 1.029 | 0.114 | 2.148 * | -0.069 | -1.280 | -0.061 | -1.127 |
| Largest No. People Supervised | 1.000 | 0.065 | 1.102 | 0.106 | 1.794 | 0.037 | 0.610 |
| Number of Prior Start-ups | 1.020 | -0.035 | -0.601 | 0.025 | 0.425 | 0.041 | 0.689 |
| Years of Industry Experience | 1.011 | 0.121 | 2.063 * | -0.019 | -0.320 | -0.054 | -0.920 |
| County Res. Tenure (Months) | 1.000 | 0.039 | 0.694 | 0.016 | 0.280 | 0.064 | 1.097 |
| Parents Self-Emp./ Bus.Owners | 1.375 | 0.020 | 0.350 | -0.058 | -1.027 | 0.083 | 1.460 |
| Purchased Business | 0.419 | -0.078 | -1.436 | 0.059 | 1.082 | -0.031 | -0.559 |
| Franchise | 3.105 **** | 0.197 | 3.705 **** | 0.013 | 0.246 | -0.028 | -0.508 |
| Sponsored Business | 0.855 | -0.008 | -0.146 | 0.038 | 0.667 | -0.045 | -0.801 |
| High School Dropout | 0.703 | 0.046 | 0.742 | -0.018 | -0.279 | -0.024 | -0.378 |
| High School Graduate | 0.585 | 0.015 | 0.185 | -0.049 | -0.609 | 0.060 | 0.753 |
| Post High School Education | 0.835 | 0.022 | 0.265 | -0.005 | -0.056 | 0.030 | 0.351 |
| College Graduate | 0.611 | -0.095 | -1.238 | 0.023 | 0.289 | -0.029 | -0.364 |
| Sector Dummies | Yes Sig. | Yes | Sig. | Yes | NS | Yes | NS |
| Constant | Yes NS | Yes | Sig. | Yes | NS | Yes | NS |
| N | 385 | 347 | | 391 | | 352 | |
| Adjusted R-sq./ Cox & Snell R-Sq. | 0.172 | 0.114 | | -0.027 | | 0.051 | |
| F-Value/ Chi-Square | 72.503 | 2.351 | **** | 0.687 | | 1.575 | * |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; $t = p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

Table 24 reports the regressions to predict the effect of gender on the percentage of customers that the respondents expected to have at different distances from their location three or four years after their businesses had become operational. The table shows that only one measure of the geographic location of customers is robust to the inclusion of the control variables in the regressions. Male entrepreneurs expect to

have a significantly smaller percentage of their customers within 20 miles of their location three or four years after their businesses had become operational (beta = -0.140, $p < 0.05$).

Table 24. Multiple Regression to Predict the Effect of Gender on Customer Location.

| Variable | Percent of Customers within 20 miles | | Percent of Customers >100 miles in U.S. | | Percent of Customers outside U.S | |
|---|--------------------------------------|-----------------|---|---------------|----------------------------------|--------------|
| | Beta | t-value | Beta | t-value | Beta | t-value |
| Male | -0.140 | -2.603 * | -0.015 | -0.239 | 0.062 | 0.903 |
| Age | -0.094 | -1.636 | 0.151 | 2.253 * | -0.008 | -0.114 |
| Married | 0.034 | 0.605 | -0.043 | -0.647 | 0.063 | 0.879 |
| Number of Household Members | 0.018 | 0.304 | -0.069 | -1.013 | -0.121 | -1.646 t |
| Log of Household Net Worth | -0.023 | -0.417 | -0.003 | -0.052 | -0.001 | -0.013 |
| White | 0.088 | 0.669 | -0.138 | -0.948 | 0.095 | 0.563 |
| Black | 0.172 | 1.533 | -0.222 | -1.777 t | 0.100 | 0.701 |
| Hispanic | 0.168 | 1.721 t | -0.184 | -1.738 t | 0.200 | 1.574 |
| Working Part Time Before Start | 0.085 | 1.614 | -0.107 | -1.718 t | -0.027 | -0.404 |
| Retired Before Start | -0.037 | -0.670 | 0.071 | 1.115 | -0.038 | -0.565 |
| Not Employed Before Start | -0.015 | -0.293 | -0.019 | -0.318 | -0.071 | -1.114 |
| Homemaker | -0.043 | -0.783 | -0.008 | -0.128 | -0.037 | -0.540 |
| Managing Business Owned by Others | 0.026 | 0.505 | 0.001 | 0.012 | 0.067 | 1.052 |
| Largest Number of People Supervised | 0.072 | 1.300 | -0.060 | -0.934 | -0.039 | -0.554 |
| Number of Prior Start-ups | -0.214 | -3.868 **** | 0.054 | 0.825 | 0.097 | 1.336 |
| Years of Industry Experience | -0.071 | -1.292 | 0.078 | 1.201 | -0.013 | -0.179 |
| County Residential Tenure (Months) | 0.059 | 1.103 | -0.090 | -1.429 | -0.029 | -0.435 |
| Parents Self-Employed/ Business Owners | 0.013 | 0.236 | -0.047 | -0.773 | 0.089 | 1.351 |
| Purchased Business | 0.041 | 0.824 | -0.042 | -0.706 | -0.025 | -0.382 |
| Franchise | 0.001 | 0.014 | -0.036 | -0.617 | 0.006 | 0.093 |
| Sponsored Business | 0.021 | 0.389 | -0.021 | -0.326 | -0.072 | -1.034 |
| High School Dropout | -0.058 | -0.973 | -0.015 | -0.239 | 0.060 | 0.772 |
| High School Graduate | -0.191 | -2.539 * | 0.108 | 1.202 | -0.032 | -0.328 |
| Post High School Education | -0.128 | -1.644 | 0.059 | 0.630 | -0.137 | -1.343 |
| College Graduate | -0.122 | -1.659 t | 0.037 | 0.421 | -0.042 | -0.434 |
| Sector Dummies | Yes | Sig. | Yes | NS | Yes | NS |
| Constant | Yes | NS | Yes | NS | Yes | NS |
| N | 387 | | 312 | | 268 | |
| Adjusted R-square/ Cox & Snell R-Square | 0.097 | | 0.038 | | 0.06 | |
| F-Value/ Chi-Square | 2.255 | **** | 1.374 | t | 1.517 | * |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.f Expectations for Venture Performance

In the bivariate analysis, we found five statistically significant differences between male and female entrepreneurs in their expectations for their businesses – male entrepreneurs had higher one- and five-year

expectations for the natural log of employment, higher one- and five-year expectations for the natural log of income, and assessed a higher probability that their ventures would become the primary source of household income than female entrepreneurs. Table 25 shows the effects of gender on these five measures of expectations in regressions that include the control variables and indicates that the effect of gender on expectations is robust to their inclusion. Male entrepreneurs have greater expectations than female entrepreneurs for first-year employment (beta = 0.119, $p < 0.10$), fifth-year employment (beta = 0.111, $p < 0.10$), first-year income (beta = 0.129, $p < 0.05$), fifth-year income (beta = 0.139, $p < 0.05$) and the odds that the venture will become the primary source of household income (beta = 0.111, $p < 0.05$).

Table 25. Multiple Regression to Predict the Effect of Gender on Expectations.

| Variable | Ln First year employment | | Ln Fifth year employment | | Ln First year income | | Ln Fifth year income | | Odds that venture will become primary source of income | |
|--|--------------------------|----------------|--------------------------|----------------|----------------------|----------------|----------------------|----------------|--|----------------|
| | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value |
| Male | 0.119 | 1.711 t | 0.111 | 1.700 t | 0.129 | 2.292 * | 0.139 | 2.482 * | 0.111 | 2.034 * |
| Age | -0.130 | -1.671 t | -0.195 | -2.661 ** | -0.079 | -1.295 | -0.004 | -0.066 | 0.007 | 0.123 |
| Married | -0.065 | -0.857 | -0.148 | -2.148 * | 0.031 | 0.518 | -0.030 | -0.504 | -0.101 | -1.777 t |
| Number of Household Members | 0.055 | 0.714 | 0.070 | 0.961 | -0.004 | -0.068 | -0.001 | -0.023 | 0.048 | 0.826 |
| Log of Household Net Worth | 0.086 | 1.117 | 0.063 | 0.872 | 0.138 | 2.406 * | 0.220 | 3.859 **** | -0.035 | -0.616 |
| White | -0.078 | -0.386 | 0.161 | 0.856 | -0.157 | -1.207 | -0.199 | -1.441 | 0.124 | 0.931 |
| Black | 0.191 | 1.069 | 0.271 | 1.631 | -0.074 | -0.666 | -0.080 | -0.667 | 0.173 | 1.509 |
| Hispanic | 0.048 | 0.332 | 0.199 | 1.504 | -0.032 | -0.332 | -0.077 | -0.776 | 0.201 | 2.055 * |
| Working Part Time Before Start | 0.077 | 1.125 | 0.051 | 0.801 | -0.040 | -0.725 | -0.051 | -0.920 | -0.055 | -1.037 |
| Retired Before Start | 0.018 | 0.239 | -0.098 | -1.335 | 0.016 | 0.286 | -0.009 | -0.158 | -0.093 | -1.693 t |
| Not Employed Before Start | 0.000 | 0.007 | 0.037 | 0.589 | -0.022 | -0.417 | 0.005 | 0.093 | 0.083 | 1.599 |
| Homemaker | 0.121 | 1.684 t | 0.036 | 0.535 | -0.054 | -0.945 | -0.003 | -0.045 | -0.017 | -0.307 |
| Managing Business Owned by Others | 0.035 | 0.541 | 0.033 | 0.549 | -0.061 | -1.177 | 0.030 | 0.571 | 0.000 | 0.008 |
| Largest Number of People Supervised | 0.031 | 0.382 | 0.039 | 0.511 | -0.046 | -0.777 | -0.022 | -0.379 | 0.018 | 0.319 |
| Number of Prior Start-ups | 0.118 | 1.620 | 0.228 | 3.346 *** | 0.166 | 2.893 ** | 0.221 | 3.926 **** | -0.061 | -1.092 |
| Years of Industry Experience | 0.133 | 1.776 t | 0.245 | 3.444 *** | 0.154 | 2.665 ** | 0.022 | 0.398 | 0.065 | 1.171 |
| County Residential Tenure (Months) | 0.052 | 0.688 | 0.071 | 0.996 | -0.085 | -1.522 | -0.070 | -1.261 | -0.035 | -0.657 |
| Parents Self-Employed/ Business Owners | 0.062 | 0.907 | 0.049 | 0.766 | 0.025 | 0.451 | 0.104 | 1.926 t | -0.014 | -0.266 |
| Purchased Business | 0.017 | 0.267 | -0.070 | -1.145 | 0.071 | 1.332 | 0.008 | 0.142 | -0.043 | -0.836 |
| Franchise | 0.028 | 0.437 | 0.074 | 1.231 | 0.002 | 0.047 | 0.031 | 0.595 | 0.130 | 2.555 * |
| Sponsored Business | 0.056 | 0.779 | -0.036 | -0.535 | 0.040 | 0.740 | -0.019 | -0.342 | -0.093 | 1.722 t |
| High School Dropout | 0.048 | 0.635 | -0.048 | -0.706 | -0.008 | -0.136 | 0.028 | 0.481 | -0.004 | -0.065 |
| High School Graduate | 0.050 | 0.557 | -0.019 | -0.227 | -0.020 | -0.258 | 0.025 | 0.331 | 0.012 | 0.161 |
| Post High School Education | 0.123 | 1.363 | 0.043 | 0.516 | 0.011 | 0.132 | -0.009 | -0.119 | 0.013 | 0.163 |
| College Graduate | 0.053 | 0.506 | 0.010 | 0.125 | -0.061 | -0.809 | -0.023 | -0.317 | -0.060 | -0.811 |
| Sector Dummies | Yes | Sig. | Yes | Sig. | Yes | Sig. | Yes | Sig. | Yes | Sig. |
| Constant | Yes | NS | Yes | NS | Yes | Sig. | Yes | Sig. | Yes | NS |
| N | 234 | | 227 | | 352 | | 344 | | 390 | |
| Adjusted R-square | 0.112 | | 0.255 | | 0.131 | | 0.160 | | 0.073 | |
| F-Value | 1.896 ** | | 3.349 **** | | 2.607 **** | | 2.991 **** | | 1.936 ** | |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.g Risk Preferences

In the bivariate analysis, we found two statistically significant differences between male and female entrepreneurs in their expectations for their businesses – male entrepreneurs were less likely than female entrepreneurs to prefer a business with a low risk-to-return ratio and assessed higher odds that ventures

founded today would still be in business in five years. Table 26 shows the effects of gender on these two measures of risk preference in regressions that include the control variables. The table shows that the effect of gender on the respondent's assessment of the odds that a business founded today would still be in business in five years does not exist after the control variables are included in the regression analysis. However, it shows that the greater preference of female entrepreneurs for businesses with a low risk-to-return ratio rather than high risk-high return ones is robust to the inclusion of the control variables (Exp(B) = 0.336, $p < 0.05$).

Table 26. Multiple Regression to Predict the Effect of Gender on Risk Preferences

| <u>Variable</u> | Prefer lower risk/ lower return business | Percent Close in 5 Years | |
|--|---|-----------------------------|----------------|
| | <u>Exp(B)</u> | <u>Beta</u> | <u>t-value</u> |
| Male | 0.336 * | 0.088 | 1.305 |
| Age | 1.000 | 0.042 | 0.583 |
| Married | 0.907 | -0.042 | -0.596 |
| Number of Household Members | 1.044 | -0.009 | -0.131 |
| Log of Household Net Worth | 0.433 | -0.011 | -0.149 |
| White | 3.184 | -0.353 | -1.858 t |
| Black | 1.484 | -0.380 | -2.338 * |
| Hispanic | 2.472 | -0.195 | -1.426 |
| Working Part Time Before Start | 2.910 | -0.047 | -0.695 |
| Retired Before Start | 0.471 | -0.002 | -0.032 |
| Not Employed Before Start | 0.796 | 0.014 | 0.215 |
| Homemaker | 1.365 | -0.015 | -0.211 |
| Managing Business Owned by Others | 3.759 * | 0.036 | 0.579 |
| Largest Number of People Supervised | 1.000 | -0.068 | -1.049 |
| Number of Prior Start-ups | 0.930 * | -0.037 | -0.522 |
| Years of Industry Experience | 1.010 | 0.040 | 0.586 |
| County Residential Tenure (Months) | 1.004 ** | -0.095 | -1.403 t |
| Parents Self-Employed/ Business Owners | 1.640 | 0.025 | 0.379 |
| Purchased Business | 1.062 | 0.000 | -0.003 t |
| Franchise | 0.434 | 0.128 | 2.046 * |
| Sponsored Business | 0.433 | 0.017 | 0.258 |
| High School Dropout | 3.945 | -0.132 | -1.892 t |
| High School Graduate | 1.800 | -0.217 | -2.266 * |
| Post High School Education | 1.579 | -0.213 | -2.182 * |
| College Graduate | 1.465 | -0.043 | -0.470 |
| Sector Dummies | Yes NS | Yes | NS |
| Constant | Yes NS | Yes | Sig. |
| N | 292 | 271 | |
| Adjusted R-square / Cox & Snell R-square | 0.191 | 0.053 | |
| F-Value/ Chi Square | 68.910 *** | 1.462 t | |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.h Opportunity Identification

In the bivariate analysis, we found six statistically significant differences between male and female entrepreneurs in the way in which they identified opportunities. Male entrepreneurs scored higher than female entrepreneurs on scales measuring the search for information and the belief that the existence of opportunities requires action; they examined more new venture ideas and gathered more new information to recognize their opportunities than female entrepreneurs; and they considered it more important to gather information on the likelihood that the positive outcome would occur and less information on the size of the positive outcome when choosing between ventures. Table 27 shows the effects of gender on these measures of opportunity identification in regressions that include the control variables. The table shows that the inclusion the effect of gender on the number of ideas that the entrepreneurs considered does not exist once the control variables are included in the regression analysis. However, it shows that the higher scores of male entrepreneurs on the search for information (Beta = 0.190, $p < 0.01$) and opportunities depend on action (Beta = 0.223, $p < 0.0001$) scales; the greater amount of new information that male entrepreneurs acquire to recognize their opportunities (Beta = 0.216, $p < 0.0001$); and their belief that it is more import to gathering information on the likelihood that the positive outcome would occur (Beta = 0.116, $p < 0.10$), and less important to gather information on the size of the positive outcome (Beta = -0.141, $p < 0.05$) are robust to the inclusion of control variables.

Table 27. Multiple Regression to Predict the Effect of Gender on Opportunity Identification.

| Variable | Search for information scale | | Opportunity dependent on action scale | | Amount of new information acquired to recognize opportunity | | Number of Ideas Considered | | Information on odds of upside | | Information on size of upside | | |
|---|------------------------------|-----------------|---------------------------------------|-------------------|---|-------------------|----------------------------|--------------|-------------------------------|----------------|-------------------------------|-----------------|-------|
| | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value | Beta | t-value | |
| Male | 0.190 | 2.890 ** | 0.223 | 3.464 **** | 0.216 | 3.381 **** | 0.104 | 1.550 | 0.116 | 1.777 t | -0.141 | -2.229 * | |
| Age | -0.011 | -0.161 | -0.047 | -0.681 | -0.003 | -0.046 | 0.032 | 0.440 | -0.053 | -0.758 | 0.076 | 1.122 | |
| Married | -0.076 | -1.119 | 0.045 | 0.683 | 0.028 | 0.417 | -0.049 | -0.698 | 0.092 | 1.357 | 0.185 | 2.814 ** | |
| Number of Household Members | 0.025 | 0.368 | -0.074 | -1.114 | 0.032 | 0.478 | -0.035 | -0.503 | -0.082 | -1.217 | -0.021 | -0.322 | |
| Log of Household Net Worth | 0.094 | 1.360 | 0.004 | 0.064 | -0.083 | -1.229 | -0.009 | -0.123 | -0.949 | 0.065 | -0.151 | -2.263 * | |
| White | -0.212 | -1.150 | -0.015 | -0.077 | 0.037 | 0.207 | -0.265 | -1.419 | -0.191 | -1.031 | -0.390 | -2.176 * | |
| Black | -0.075 | -0.474 | 0.045 | 0.279 | 0.135 | 0.873 | -0.100 | -0.622 | 0.086 | -0.545 | -0.299 | 1.951 t | |
| Hispanic | 0.016 | 0.120 | 0.084 | 0.615 | 0.053 | 0.407 | -0.115 | -0.861 | -0.112 | -0.835 | -0.128 | -0.989 | |
| Working Part Time Before Start | 0.098 | 1.519 | 0.090 | 1.428 | 0.016 | 0.253 | 0.151 | 2.311 * | -0.145 | -2.258 * | -0.013 | -0.212 | |
| Retired Before Start | 0.099 | 1.529 | 0.025 | 0.389 | 0.030 | 0.469 | 0.113 | 1.710 t | -0.010 | -0.160 | # | 0.031 | 0.495 |
| Not Employed Before Start | 0.102 | 1.644 | 0.019 | 0.316 | 0.019 | 0.315 | 0.026 | 0.418 t | 0.111 | 1.794 t | 0.040 | 0.659 | |
| Homemaker | 0.019 | 0.275 | -0.113 | -1.714 t | 0.000 | -0.003 | -0.135 | -1.966 * | 0.046 | 0.692 | -0.062 | -0.948 | |
| Managing Business Owned by Others | 0.028 | 0.457 | -0.061 | -1.011 | -0.027 | -0.453 | 0.030 | 0.470 | -0.003 | -0.047 | 0.078 | 1.319 | |
| Largest Number of People Supervised | -0.089 | -1.418 | -0.090 | -1.461 | -0.032 | -0.527 | -0.012 | -0.192 | 0.033 | 0.535 | 0.013 | 0.207 | |
| Number of Prior Start-ups | 0.066 | 0.969 | 0.035 | 0.528 | 0.280 | 4.206 **** | 0.084 | 1.227 t | 0.058 | 0.854 | 0.085 | 1.287 | |
| Years of Industry Experience | -0.111 | -1.698 t | 0.040 | 0.624 | -0.089 | -1.385 | 0.108 | 1.629 | 0.088 | 1.353 | -0.110 | -1.739 t | |
| County Residential Tenure (Months) | 0.026 | 0.401 | 0.117 | 1.819 t | 0.004 | 0.055 | -0.114 | -1.696 t | -0.038 | -0.582 | -0.034 | -0.543 | |
| Parents Self-Employed/ Business Owners | 0.046 | 0.735 | -0.025 | -0.407 | 0.010 | 0.170 | -0.015 | -0.233 | -0.052 | -0.825 | -0.071 | -1.155 | |
| Purchased Business | 0.015 | 0.245 | 0.002 | 0.026 | -0.018 | -0.296 | 0.110 | 1.736 t | -0.021 | -0.338 | 0.071 | 1.192 | |
| Franchise | -0.008 | -0.123 | 0.102 | 1.708 t | 0.033 | 0.564 | -0.017 | -0.276 * | 0.068 | 1.132 | -0.021 | -0.350 | |
| Sponsored Business | -0.080 | -1.244 | -0.111 | -1.759 t | -0.012 | -0.184 | -0.016 | -0.247 | 0.128 | 1.991 * | -0.058 | -0.929 | |
| High School Dropout | -0.077 | -1.089 | 0.160 | 2.272 * | -0.090 | -1.286 | -0.131 | -1.781 t | -0.111 | -1.561 | -0.046 | -0.666 | |
| High School Graduate | -0.033 | -0.353 | 0.088 | 0.964 | -0.007 | -0.081 | -0.010 | -0.107 | 0.083 | 0.893 | 0.223 | 2.474 * | |
| Post High School Education | 0.019 | 0.196 | 0.074 | 0.792 | -0.088 | -0.946 | 0.001 | 0.007 | 0.048 | 0.505 | 0.148 | 1.597 | |
| College Graduate | -0.106 | -1.187 | 0.107 | 1.223 | -0.143 | -1.637 | -0.052 | -0.585 | -0.101 | -1.130 | -0.011 | -0.126 | |
| Sector Dummies | Yes | NS | Yes | NS | Yes | Sig. | Yes | NS | Yes | NS | Yes | NS | |
| Constant | Yes | Sig. | Yes | Sig. | Yes | NS | Yes | NS | Yes | Sig. | Yes | Sig. | |
| N | 287 | | 288 | | 293 | | 279 | | 292 | | 292 | | |
| Adjusted R-square/ Cox & Snell R-Square | 0.047 | | 0.082 | | 0.074 | | 0.036 | | 0.036 | | 0.093 | | |
| F-Value/ Chi-Square | 1.425 | | t | | 1.781 ** | | 1.708 * | | 1.312 | | 1.326 | | |
| | | | | | | | | | | | 1.908 ** | | |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; $t = p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

IV.2.i Confidence in Venture Organizing Abilities

In the bivariate analysis, we found one statistically significant difference between male and female entrepreneurs in their level of confidence in the organizing process – male entrepreneurs had greater confidence than female entrepreneurs that they could attract employees. Table 28 shows the effects of gender on confidence in attracting employees in regressions that include the control variables. The table shows that the effect of gender on confidence in attracting employees no longer exists once the control variables are included in the regression analysis. Thus, we must conclude that the uncontrolled gender effect on effort was an artifact of the correlation between gender and at least one of the control variables.

Table 28. Multiple Regression to Predict the Effect of Gender on Confidence in the Organizing Process.

| <u>Variable</u> | Confidence in Attracting employees | | |
|--|--|----------------|------|
| | <u>Beta</u> | <u>t-value</u> | |
| Male | 0.096 | 1.528 | |
| Age | -0.049 | -0.727 | |
| Married | -0.069 | -1.057 | |
| Number of Household Members | 0.031 | 0.479 | |
| Log of Household Net Worth | 0.051 | 0.763 | |
| White | -0.315 | -1.790 | t |
| Black | -0.058 | -0.384 | |
| Hispanic | -0.020 | -0.157 | |
| Working Part Time Before Start | 0.003 | 0.041 | |
| Retired Before Start | -0.046 | -0.734 | |
| Not employed Before Start | 0.035 | 0.583 | |
| Homemaker | -0.056 | -0.864 | |
| Managing Business Owned by Others | -0.061 | -1.034 | |
| Largest Number of People Supervised | -0.013 | -0.208 | |
| Number of Prior Start-ups | 0.184 | 2.803 | ** |
| Years of Industry Experience | 0.024 | 0.375 | |
| County Residential Tenure (Months) | 0.025 | 0.407 | |
| Parents Self-Employed/ Business Owners | 0.064 | 1.054 | |
| Purchased Business | 0.067 | 1.128 | |
| Franchise | -0.060 | -1.034 | |
| Sponsored Business | 0.061 | 0.979 | |
| High School Dropout | 0.010 | 0.142 | |
| High School Graduate | 0.011 | 0.126 | |
| Post High School Education | -0.006 | -0.068 | |
| College Graduate | 0.018 | 0.212 | |
| Sector Dummies | Yes | | Sig. |
| Constant | Yes | | NS |
| N | 289 | | |
| Adjusted R-square | 0.118 | | |
| F-Value | 2.171 | **** | |

Note: NS= Not significant; Sig. = significant at the p< 0.05 level; t = p< 0.10; * = p<0.05; ** = p< 0.01; *** = p< 0.001; **** = p< 0.0001.

IV.2.j Start-up Problems

In the bivariate analysis, we found three statistically significant differences between male and female entrepreneurs in start-up problems – male entrepreneurs had greater problems than female entrepreneurs being taken seriously as a business person; receiving support from those close to them; and with lack of mentors who can provide support for their businesses. Table 29 shows the effects of gender on these start-up problems in regressions that include the control variables. The table shows that the effect of gender on the lack of mentors is “driven away” by the inclusion of control variables. However, two effects of gender on start-up problems are robust to the inclusion of the control variables. Male entrepreneurs are significantly

more likely than female entrepreneurs to have a problem being taken seriously as a business person (beta = 0.170, $p < 0.05$) and receiving the support of those close to them (beta = 0.143, $p < 0.05$).

Table 29. Multiple Regression to Predict the Effect of Gender on Start-up Problems.

| Variable | Being taken seriously as a business | | Receiving support from those close to me | | Lack of mentors or others who can provide support | |
|--|-------------------------------------|----------------|--|----------------|---|--------------|
| | Beta | t-value | Beta | t-value | Beta | t-value |
| Male | 0.170 | 2.610 * | 0.143 | 2.174 * | 0.106 | 1.632 |
| Age | -0.015 | -0.213 | 0.125 | 1.753 t | 0.030 | 0.427 |
| Married | -0.025 | -0.369 | -0.025 | -0.365 | 0.043 | 0.628 |
| Number of Household Members | -0.028 | -0.414 | 0.055 | 0.803 | -0.044 | -0.653 |
| Log of Household Net Worth | -0.099 | -1.443 | -0.007 | -0.097 | -0.009 | -0.126 |
| White | -0.062 | -0.335 | 0.160 | 0.862 | 0.181 | 0.987 |
| Black | 0.000 | -0.001 | 0.217 | 1.365 | 0.155 | 0.987 |
| Hispanic | -0.067 | -0.504 | 0.166 | 1.244 | 0.137 | 1.040 |
| Working Part Time Before Start | -0.065 | -1.018 | 0.020 | 0.304 | -0.012 | -0.190 |
| Retired Before Start | -0.080 | -1.240 | -0.066 | -1.019 | 0.044 | 0.687 |
| Not Employed Before Start | 0.042 | 0.675 | -0.019 | -0.304 | -0.001 | -0.015 |
| Homemaker | 0.018 | 0.269 | -0.010 | -0.155 | 0.014 | 0.217 |
| Managing Business Owned by Others | -0.017 | -0.284 | -0.036 | -0.590 | 0.069 | 1.134 |
| Largest Number of People Supervised | 0.006 | 0.098 | -0.072 | -1.140 | -0.111 | -1.778 t |
| Number of Prior Start-ups | -0.014 | -0.211 | 0.048 | 0.704 | -0.077 | -1.143 |
| Years of Industry Experience | -0.050 | -0.774 | -0.005 | -0.075 | 0.045 | 0.691 |
| County Residential Tenure (Months) | 0.034 | 0.523 | -0.018 | -0.267 | 0.072 | 1.116 |
| Parents Self-Employed/ Business Owners | 0.042 | 0.668 | 0.021 | 0.336 | -0.088 | -1.399 |
| Purchased Business | -0.092 | -1.492 | -0.021 | -0.345 | -0.073 | -1.182 |
| Franchise | 0.018 | 0.294 | 0.040 | 0.647 | -0.111 | -1.838 t |
| Sponsored Business | 0.069 | 1.076 | 0.139 | 2.142 * | -0.085 | -1.329 |
| High School Dropout | 0.208 | 2.923 ** | 0.093 | 1.306 | -0.028 | -0.392 |
| High School Graduate | 0.094 | 1.009 | 0.250 | 2.664 ** | 0.152 | 1.639 |
| Post High School Education | 0.092 | 0.971 | 0.106 | 1.106 | 0.090 | 0.945 |
| College Graduate | 0.005 | 0.052 | 0.056 | 0.619 | 0.055 | 0.615 |
| Sector Dummies | Yes | NS | Yes | NS | Yes | Sig. |
| Constant | Yes | Sig. | Yes | NS | Yes | NS |
| N | 293 | | 292 | | 292 | |
| Adjusted R-square | 0.038 | | 0.020 | | 0.041 | |
| F-Value | 1.346 | | 1.180 | | 1.382 t | |

Note: NS= Not significant; Sig. = significant at the $p < 0.05$ level; t = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; **** = $p < 0.0001$.

V. CONCLUSIONS

Understanding the similarities and differences in entrepreneurial activity of men and women is an important question for both scholarly understanding and public policy. If male and female entrepreneurs engage in entrepreneurial activity in the same way and with the same outcomes, then gender would not be an important dimension for entrepreneurship researchers or policy makers to consider.

This study sought to provide a greater understanding of the effect of gender on a variety of dimensions of entrepreneurial activity by exploring the PSED, a survey of a representative sample of

entrepreneurs who started businesses in the United States in 1998 and 1999. It looked at a wide variety of different dimensions of entrepreneurial activity: performance outcomes; motivations for starting new businesses; effort expended on the ventures; the size of the ventures started; the type of businesses founded; the entrepreneurs' expectations for the newly founded businesses; their risk preferences, the process of opportunity identification that they used; their confidence in their entrepreneurial abilities; and the start-up problems that they faced. On several of these dimensions robust, statistically significant, and substantive differences between male and female entrepreneurs were found, and remained after controlling for a variety of other factors that could account for them. On other dimensions, no statistically significant effect of gender was found.

V.1 Main Findings

The first finding of this study is that there is little evidence in the PSED of differences between male and female entrepreneurs on either effort or performance. However, several robust differences in the type of businesses that men and women found were observed. The analyses showed that male entrepreneurs were significantly more likely than female entrepreneurs to found technologically intensive businesses (two measures); businesses that will lose their competitive advantage more quickly, and businesses that have a less geographically localized customer base.

In general, the analysis showed more robust results in terms of attitudes and perceptions. There was robust evidence that male entrepreneurs were significantly less likely than female entrepreneurs to prefer low-risk/low-return businesses. There was also robust evidence of different motivations between male and female entrepreneurs. In particular, male entrepreneurs were more likely than female entrepreneurs to start businesses to make money and to believe that starting a business is more important than spending time with one's family. Male entrepreneurs were significantly more likely than female entrepreneurs to see business owners as community leaders, suggesting that male entrepreneurs are more highly motivated to start businesses to achieve recognition than women are. Finally, male entrepreneurs had significantly higher expectations for their new businesses than female entrepreneurs.

However, in contrast to the previous literature, we found no evidence of gender differences in self-confidence in the ability to undertake the firm organizing process. Moreover, we found no evidence that female entrepreneurs perceive that they face greater problems in the organizing process than male entrepreneurs. In fact, we found robust evidence that male entrepreneurs were significantly more likely than female entrepreneurs to believe that they faced problems being taken seriously as business people and in receiving support for those close to them.

We found intriguing robust differences on one dimension of entrepreneurial activity rarely examined in the previous literature: opportunity identification. Male entrepreneurs were significantly more likely than female entrepreneurs to report that they identify opportunities through research; to believe that the existence

of new business opportunities depends on action; and to report that they gather a lot of new information in the process of identifying their business opportunities. Male entrepreneurs were also significantly more likely than female entrepreneurs to view as important gathering information on the odds of a positive outcome occurring with their ventures, and significantly less likely to view as important gathering information on the size of that outcome in choosing between different ventures.

V.2 Limitations

What factors explain these patterns? One explanation is that they are the result of the limitations of the PSED data. First, gender might have much greater effects on beliefs and attitudes than it does on actual actions. Because the PSED data is largely self-reported, the fact that we saw many differences on preferences, motivations, and expectations, and fewer on actions might just reflect differences in the way in which male and female entrepreneurs answer questions.

Second, the small sample size and short time horizon of the PSED might account for many of the null findings. Because many of the differences between male and female entrepreneurs discussed in the literature come from the examination of very large datasets, substantive differences between entrepreneurs of the two genders may not be statistically significant in the PSED because the sample size is very small.

In addition, the short time horizon could account for the null findings. Because the PSED begins with the examination of people in the process of starting a business and gathers data only over four years, it may capture only the initial differences between male and female entrepreneurs. Many important differences may not become visible until businesses become older because the different trajectories of the two groups widen over time.

Third, the PSED might confound entrepreneurs with people who say they are starting a business, but never really do so. The small proportion (one-third) of the sample that has a business that the respondent views as “up-and-running” at any time during the four-year observation period, suggests that the majority of the sample may be people who never actually get a new business started. The inclusion of these people in the sample might result in the lack of findings that are observed in other datasets that look only at employer firms or people for whom self-employment is their primary occupation.

Fourth, differential selection into starting a business might account for many of the patterns observed among male and female entrepreneurs. Men are twice as likely as women to start businesses. The lower proportion of women who start businesses might account for the different distribution of characteristics among male and female entrepreneurs.

V.3 Contributions to the Literature

The above limitations notwithstanding, our study contributes to the literature on gender differences in entrepreneurship by showing the presence or absence of support for many previous findings about gender

differences in entrepreneurial activity. Specifically, the more limited findings shown in the PSED, in comparison to previous studies, indicate the limitations of previous studies, and suggest caution in assuming their validity. First, because the PSED is a survey of a representative sample of people in the process of starting new businesses in the United States, differences between the findings here and those of prior studies might exist because of recall bias in previous studies. Second, differences between the results here and many of previous studies might result from differences in self-employment on the one hand, and business formation on the other. Third, the differences between the results of previous studies and the results of this study might be explained by selection bias in previous studies, like the Survey of Small Business Finances, which survey surviving small businesses. Fourth, the differences between the results of this study and those of previous studies might exist because of unobserved heterogeneity in previous studies that examine data sources like the Statistics of Income and the Current Population Survey, which include a limited number of variables. Fifth, the differences between the findings here and those of previous studies might exist because many previous studies examined convenience samples that are not representative of the underlying U.S. population.

V.4 Contributions to Public Policy

Our study makes several contributions to public policy. First, it shows that there is no evidence in the PSED for the effect of gender on new venture performance. Second, the study provides useful information about structural barriers to female entrepreneurship. This study shows that preferences, motivations and expectations are not randomly distributed across gender. It also indicates that analyzing the effect of structural barriers on new venture performance requires precise measurement of the effects of gender on these things. Failure to measure the effect of preferences, motivations and expectations, or inaccurate measurement of the effect of these factors, will lead to biased estimates of the effects of structural barriers, and over- or under-estimation of their effects.

VI. REFERENCES

- Alsos, G., and Ljunggren, E., 1998. "Does The Business Start-Up Process Differ By Gender? A Longitudinal Study of Nascent Entrepreneurs?" In Reynolds, P., Bygrave, W., Carter, N., Manigart, S., Mason, C., Meyer, G., and Shaver, K. (eds.), Frontiers of Entrepreneurship Research, Babson College: Babson Park, MA.
- Anna, L., Chandler, G., Jansen, E., and Mero, N., 2000. "Women Business Owners in Traditional and Non-traditional Industries," Journal of Business Venturing, 15(3): 279-303.
- Arch, E., 1993. "Risk-taking: A Motivational Basis for Sex Differences." Psychological Reports, 73(3): 6-11.
- Baker, T., Aldag, R., and Blair, E., 2003. "Gender and Entrepreneurial Opportunity Evaluation." Paper Presented at the 23rd Annual Babson Kauffman Entrepreneurship Research Conference, Babson College: Wellesley, MA.
- Barrett, M., 1995. "Feminist Perspectives On Learning For Entrepreneurship: The View From Small Business." In W. Bygrave, Bird, B., Birley, S., Churchill, N., Hay, M., Keeley, R., and Wetzel, W. (eds.), Frontiers of Entrepreneurship Research, Babson Park: Babson College: 323-336.
- Birley, S., 1989. "Female Entrepreneurs: Are They Really any Different?" Journal of Small Business Management, 27(1): 32-37.
- Boden, R., 1999. "Flexible Working Hours, Family Responsibilities, and Female Self-Employment." American Journal of Economics and Sociology, 58(11): 71-83.
- Boden, R., 2000. "Analyses of Business Dissolution by Demographic Category of Ownership." contract report for the Office of Advocacy, U.S. Small Business Administration, www.sba.gov/advo/research/rs204tot.pdf.
- Boden, R., 1996. "Gender and Self-Employment Selection: An Empirical Assessment." Journal of Socio-Economics, 25(6): 671-682.
- Boden, R., and Nucci, A., 2000. "On The Survival Prospects Of Men's And Women's New Business Ventures," Journal of Business Venturing, 15(4): 347-362.
- Brown, W., 2002. "Ambition Versus Action: Do Males and Females Exhibit Conflicting Perspectives of Entrepreneurial Potential and Growth. A Study among Entrepreneurship Students and Entrepreneurship Graduates Before and After Start-Up." Paper presented at the 25th Institute for Small Business and Entrepreneurship National Small Firms Policy and Research Conference: Competing Perspectives of Small Business and Entrepreneurship.
- Brush, C., 1992. "Research on Women Business Owners: Past Trends, a New Perspective and Future Directions." Entrepreneurship Theory and Practice, 16(4): 5-30.
- Brush, C., Carter, N., Gatewood, E., Greene, P., and Hart, M., 2006. *Women's Entrepreneurship in the United States*. In Brush, C., Carter, N., Gatewood, E., Greene, P., and Hart, M. (Eds.), Growth-Oriented Women Entrepreneurs and Their Businesses, Cheltenham, UK: Edward Elgar.
- Buttner, E., and Moore, D., 1997. "Women's Organizational Exodus to Entrepreneurship: Self-Reported Motivations and Correlates with Success." Journal of Small Business Management, 26: 31-35.

- Byrnes, J., Miller, D., and Schafer, W., 1999. "Gender Differences In Risk Taking: A Meta-Analysis." Psychological Bulletin, 125:367-383.
- Carter, N., and Allen, K., 1997. "Size-determinants of Women-Owned Businesses: Choice or Barriers to Resources." Entrepreneurship and Regional Development, 9(3): 211-220.
- Carter, N., Gartner, W., and Reynolds, P., 1997. "Discontinuance Among New Firms In Retail: The Influence Of Initial Resources, Strategy, And Gender," Journal of Business Venturing, 12:125-145.
- Carter, N., Gartner, W., Shaver, K., and Gatewood, E., 2003. "The Career Reasons of Nascent Entrepreneurs," Journal of Business Venturing, 18: 13-39.
- Cassar, G., 2006. "Entrepreneur Opportunity Costs and Intended Venture Growth." Journal of Business Venturing, 21: 610-632.
- Cliff, J., 1998. "Does One Size Fit All? Exploring the Relationship Between Attitudes Towards Growth, Gender, and Business Size," Journal of Business Venturing, 13(6): 523-542.
- Connelly, R., 1992. "Self-Employment and Finding Childcare," Demography, 29(1): 17-29.
- Davis, A., and Aldrich, H., 2004. "Work Participation History". In Gartner, W., Shaver, K., Carter, N., and Reynolds, P. (eds.), Handbook of Entrepreneurial Dynamics: The Process of Business Creation. Sage Publications: Thousand Oaks, CA.
- DeMartino, R., and Barbato, R., 2003. "Differences Between Women and Men MBA Entrepreneurs: Exploring Family Flexibility and Wealth Creation as Career Motivators," Journal of Business Venturing, 18: 815-832.
- Du Rietz, A., and Henrekson, M., 2000. "Testing the Female Underperformance Hypothesis," Small Business Economics, 14: 1-10.
- Eckel, C., and Grossman, P., 2002. "Sex Differences And Statistical Stereotyping In Attitudes Toward Financial Risk," Evolution and Human Behavior, 23(4): 281-295.
- Fischer, E., Reuben, R., and Dyke, L., 1993. "A Theoretical Overview and Extension of Research on Sex, Gender, and Entrepreneurship," Journal of Business Venturing, 8: 151-168.
- Gatewood, E., Shaver, K., and Gartner, W., 1995. "A Longitudinal Study of Cognitive Factors Influencing Start-up Behaviors and Success at Venture Creation," Journal of Business Venturing, 10: 371-391.
- Georgellis, Y., and Wall, H., 2004. "Gender Differences in Self-Employment," working paper, The Federal Reserve Bank of Saint Louis. <http://research.stlouisfed.org/wp/1999/1999-008.pdf>.
- Jianakoplos, N., and Bernasek, A., 1998. "Are Women More Risk Averse?" Economic Inquiry, 36: 620-630.
- Jurik, N., 1998. "Getting Away and Getting By: The Experiences of Self-Employed Homemakers," Work and Occupations, 25(11): 7-35.
- Kalleberg, A., and Leicht, K., 1991. "Gender and Organizational Performance: Determinants of Small Business Survival and Success," Academy of Management Journal, 34(1): 136-161.

- Lombard, K., 2001. "*Female Self-Employment and Demand for Flexible, Nonstandard Work Schedules,*" Economic Inquiry, 39(2): 214-237.
- Longstreth, M., Stafford, K., and Maudlin, T., 1987. "*Self-employed Women and their Families: Time Use and Socioeconomic Characteristics,*" Journal of Small Business Management, 25(3): 30-37.
- Mallette, H. and McGuinness, N., 1999. "*Gender Differences in the Entrepreneurial Start-Up Process,*" working paper, Mount Saint Vincent University.
- Minniti, M., Allen, I., and Langowitz, N., 2005. Global Entrepreneurship Monitor 2005 Report on Women and Entrepreneurship, Babson Park, MA: Babson College.
- Mirchandani, K., 1999. "*Feminist Insight on Gendered Work: New Directions in Research on Women and Entrepreneurship,*" Gender, Work and Organization, 6(4): 224.
- OECD, 1998. Women Entrepreneurs in Small and Medium Enterprises, OECD: Paris.
- Office of Advocacy, 2006. Women in Business, U.S. Small Business Administration. <http://www.sba.gov/advo/research/rs280tot.pdf>.
- Office of Advocacy, 2005. The Small Business Economy: A Report to the President, Washington DC: U.S. Government Printing Office.
- Office of Advocacy, 2001. Women in Business, working paper, U.S. Small Business Administration. <http://www.sba.gov/advo/stats/wib01.pdf>.
- Presser, H. and Baldwin, W., 1980. "*Child Care as a Constraint on Employment: Prevalence, Correlates, and Bearing on the Work and Fertility Nexus,*" The American Journal of Sociology, 85(5): 1202-1213.
- Renzulli, L., Aldrich, H., and Moody, J., 2000. "*Family Matters: Gender, Networks, and Entrepreneurial Outcomes,*" Social Forces, 79(2): 523-546.
- Reynolds, P., 2000. "*National Panel Study Of U.S. Business Start-Ups: Background And Methodology,*" Databases for the Study of Entrepreneurship, 4: 153-227.
- Reynolds, P., Forthcoming. New Firm Creation in the U.S.: A PSED I Overview, Berlin: Springer-Verlag.
- Reynolds, P., Carter, N., Gartner, W., and Greene, P., 2004. "*The Prevalence of Nascent Entrepreneurs in the United States: Evidence from the Panel Study of Entrepreneurial Dynamics,*" Small Business Economics, 23: 263-284.
- Reynolds, P., and Curtin, R., 2004. "*Data Collection,*" In Gartner, W., Shaver, K., Carter, N., and Reynolds, P. (Eds.), Handbook of Entrepreneurial Dynamics: The Process of Business Creation. Sage Publications: Thousand Oaks, CA.
- Robb, A., and Wolken, J., 2002. "*Firm, Owner, And Financing Characteristics: Differences Between Male And Female-Owned Small Businesses,*" working paper, Federal Reserve Board of Governors, www.federalreserve.gov/Pubs/FEDS/2002/200218/200218pap.pdf.
- Rosa, P. Carter, S., and Hamilton, D., 1996. "*Gender as a Determinant of Small Business Performance: Insights from a British Study,*" Small Business Economics, 8: 463-478.

- Sexton, D., and Bowman-Upton, N., 1990. "*Female and Male Entrepreneurs: Psychological Characteristics and Their Role in Gender-Related Discrimination.*" Journal of Business Venturing 5(1): 29-36.
- Shane, S., Kolvereid, L., and Westhead, P., 1991. "*An Exploratory Examination of the Reasons Leading to New Firm Formation Across Country and Gender.*" Journal of Business Venturing, 6:431-446.
- Srinivasan, R., Woo, C., and Cooper, A., 1993. "*Performance Determinants For Male And Female Entrepreneurs.*" In Bygrave, W., Birley, S., Churchill, N., Gatewood, E., Hoy, F., Keeley, R., and Wetzel, W. (eds.), Frontiers of Entrepreneurship Research, Babson Park: Babson College, 43-56.
- Stoner, C., Hartman, R., and Arora, R., 1990. "*Work-Home Role Conflict in Female Owners of Small Businesses: An Exploratory Study.*" Journal of Small Business Management, 29(1): 30-38.
- Taniguchi, H., 2002. "*Determinants of Women's Entry into Self-Employment.*" Social Science Quarterly, 83(3): 875-894.
- Van Stel, A., Wenneckers, A. Thurik, A., and Reynolds, P., 2003. "*Explaining Nascent Entrepreneurship Across Countries.*" working paper, EIM Business and Policy Research.
- Verheul, I., Carree, M., and Thurik, R., 2004. "*Allocation and Productivity of Time in New Ventures of Female and Male Entrepreneurs.*" Paper Presented at the Babson Kauffman Entrepreneurship Research Conference, Glasgow, Scotland.
- White, R., Thornhill, S., Hampson, E., Forthcoming. "*Entrepreneurship And Evolutionary Biology: The Relationship Between Testosterone And New Venture Creation.*" Organizational Behavior and Human Decision Processes.