

Discussion Papers

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Berlin, April 2006



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German Institute
for Economic Research

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American entrepreneurship in black and white**

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Abstract

Using a sample obtained from a survey conducted in the United States during summer 2002, we study the variables related to observed differences in the rate of entrepreneurial involvement between black and white Americans. We find strong evidence that differences in subjective and often biased perceptions are highly associated with entrepreneurial propensity across these two racial groups. In addition, we find that black Americans tend to exhibit more optimistic perceptions of their business environment than other racial groups and are more likely than others to attempt starting a business. In fact, our results show that blacks are almost twice as likely as whites to try starting a business. Thus, our results suggest that the under representation of black Americans among established entrepreneurs is not due to lack of trying but may instead be due to stronger barriers to entry and higher failure rates.

Keywords: Entrepreneurship, Black Entrepreneurship, Minority Entrepreneurship, Nascent Entrepreneurship.

JEL Classifications: D01, J15, J23, M13

1 Introduction

The last 15 years have seen a significant increase in the participation of minorities in the U.S. labor force and, as a result, a rapid growth in the number of self-employed black, Hispanic, and Asian Americans relative to white Americans (Fairlie and Sundstrom, 1997; Fairlie, 2004). In spite of the increase in minority self-employment, the difference between the percent of self-employed blacks and whites is still striking. While approximately 11.6% of white workers are self-employed, only 3.8% of blacks are self-employed (U.S. Bureau of the Census 1993). The three-to-one ratio in the self-employment rate holds for both men and women and for men has remained roughly constant over the past 80 years (Fairlie and Meyer, 2000). Our results suggest that such a lack of participation in business ownership among blacks is not due to a lack of entrepreneurial propensity but, rather, to the existence of uneven barriers to entry across races and to higher failure rates among minorities.

Several studies have examined the connection between racial differences and self-employment patterns. Studies of entrepreneurship among minorities include Bates (2000), Borjas and Bronars (1989), Fairlie (1999, 2004), Fairlie and Meyer (1996), Hout and Rosen (2000), Light and Rosenstein (1995), and Meyer (1990). Using a variety of data sources, these works investigate differences in the rates of involvement in self-employment and business ownership across a variety of ethnic and racial groups in the United States. With remarkable regularity, black and Hispanic Americans are shown to exhibit lower rates of self-employment than other ethnic groups.

The last two decades have seen the emergence of a number of theoretical and empirical models of self-employment and entrepreneurial behavior (see Parker (2004) for a detailed and comprehensive analysis of the decision to become self-employed). At the empirical level, several works have used individual level data to identify socio-economic characteristics of self-employed individuals such as age, education, work status, and income (among them Blanchflower, 2004; Evans and Leighton, 1989; Parker and Robson, 2004; Reynolds et al., 2003). Socio-economic characteristics have also been analyzed by looking at human and social capital (Davidsson and Honig,

2003). In this area, of particular relevance are studies on the influence of formal and informal networks (Aldrich, 1999; Aldrich and Martinez, 2001), as well as works on the importance of role models (Wagner and Sternberg, 2004; Walstad and Kourilsky, 1998) for entrepreneurial decisions. Recent studies have complemented these works by adding explicitly the role played by perceptual variables on the decision to start a business (Arenius and Minniti, 2005; Koellinger et al. 2005). Finally, some scholars have analyzed the role played by macroeconomic conditions on an individual's decision to start a business and shown that technology, level of economic development, culture, and institutions all influence the demand for entrepreneurship by providing start up opportunities (Thurik et al., 2002).

Although large differences across races in variables such as age, education, work status, asset levels, and parental self-employment, are found to contribute somewhat to the differences in self-employment rates across racial groups, Fairlie and Meyer (1996) find that socio-economic characteristics explain only a small portion of the large gap between US racial groups and, in particular, between the rate of self-employment for black Americans and the average U.S. rate. Using 1980 Census data, for example, Borjas and Bronars (1989) argued that minority self-employed workers have lower incomes than their white counterparts and that the income distribution of self-employed minority workers has lower variance than the income distribution of self-employed whites. The latter result implies that the gains from self-employment to minorities are comparatively smaller and, therefore, minority workers have lower incentives to become self-employed. Labor economists have drawn upon human capital theories arguing that family and individual characteristics determine the availability of resources, which, in turn, determine occupational choices and situations. In Fairlie's (1999) interpretation, for example, differences in self-employment between blacks and whites are due, in large part, to blacks having lower assets and a lower likelihood of a self-employed father. Overall, although a significant amount of empirical research has shown that socio-economic variables are somewhat relevant, after controlling for most of them, minorities still exhibit occupational differences. What else then contributes to the observed differences in entrepreneurial involvement between black and white Americans?

Much of the literature on ethnic entrepreneurship stresses geographical concentration, reliance on co-ethnic markets, and replacement capital in markets abandoned by indigenous businesses or

large firms. Borjas and Bronars (1989), for example, provide some evidence that the large observed variance in self-employment rates across racial groups (Asians, Hispanics, blacks and whites) is partly due to consumer discrimination. That is, it arises from white consumers' dislike for purchasing goods and services from blacks and other minorities. On the other hand, using data from the 1987 Characteristics of Business Owners, Meyer (1990) finds that black businesses are relatively more common in industries with primarily white customers. In an alternative, Light and Rosenstein (1995) argued that those who are excluded from the mainstream economy because of discrimination will often turn to business ownership as an alternative to the labor market, thereby choosing self-employment as an alternative to unemployment. This theory has been used to explain why, in a wide variety of societies, immigrants and minorities often embrace entrepreneurship as survival strategy and have high rates of small-business ownership (Horton and Dejong, 1991). Fairlie and Meyer (1996), however, have provided evidence against the argument by showing that self-employment rates are actually higher among more advantaged racial groups. Finally, discrimination in general has been proposed to explain differences in success rates among racial groups. In statistical discrimination models, individuals use race as a proxy for unobservable behaviors and characteristics (Arrow, 1998; Phelps, 1972). Under such models, black Americans receive lower returns to observable skills or characteristics because individuals of other races discount those skills. Finally, the actual asymmetry between entrepreneurial survival rates of blacks and whites can be also explained, at least in part, by discrimination in the small business credit market (Bates, 1989; Blanchflower et al., 2001; Fairlie, 1999).

Using a sample obtained from a survey conducted in the United States during spring 2002, and a set of probit models, we study what variables correlate significantly to the observed differences in the rate of entrepreneurial involvement between black and white Americans at various stages of the venture creation process. Specifically, we are interested in discovering what variables, if any, are highly associated with observed differences in the number of black and white Americans involved in various stages of the entrepreneurial process (nascent, baby, established), and whether the relative importance of these variables changes when different stages of the entrepreneurial process are considered.

Overall, our paper contributes to the existing literature on nascent entrepreneurship by showing that constraints and not preferences are behind racial differences in business ownership, a finding that, of course, has significant policy implications. Specifically, we find that black Americans are more likely to try starting a business than whites and that perceptual differences among the two groups seem to be associated with much of the observed gap in start-up activity. In particular, above average levels of confidence and optimism are associated with higher rates of early-stage entrepreneurship among blacks compared to the other ethnic groups in the United States. In fact, our results show that blacks are almost twice more likely to try starting a business than whites but are significantly less likely than white Americans to own an established business that survives in the market beyond the initial start up process. Thus, our findings suggest that black entrepreneurs are more likely to fail than whites in the early stages of the entrepreneurial process. As mentioned earlier, this suggests that external constraints rather than personal preferences are at the roots of the asymmetry.

Finally, our study provides also a good example of why looking at nascent entrepreneurs may be important. In fact, by describing the early stages of the entrepreneurial process, information on nascent entrepreneurship enables us to understand entrepreneurial propensity and to avoid misconceptions about entrepreneurial behavior caused by focusing on established entrepreneurs, that is, on individuals who have already survived in the market.

2 Data

Data used in our analysis were collected for the 2002 US population survey of the Global Entrepreneurship Monitor (GEM) project.¹ GEM is an ongoing large scale academic project designed to study the causes and implications of entrepreneurial behavior across countries. Standardized surveys were conducted in each participating country. In the United States, the survey was conducted by the survey research firm Market Facts. The survey consisted of a pretest of 1,001 individuals, followed by the survey of 6,058 individuals. The main purpose of the survey was to

¹ More details on the GEM project can be found at www.gemconsortium.org

identify individuals who, at the time of the survey, owned and managed a business or were in the process of starting one. If either or both of these criteria applied, respondents were asked follow-up questions that allowed the construction of a profile for the respondents and their businesses. Among other things, respondents were asked the age of their venture and whether or not the business had already paid wages. These criteria were then used to identify the number of people involved in entrepreneurial activity in each country, and to distinguish between nascent entrepreneurs, baby business owners and established business owners.²

Individuals were coded as nascent entrepreneurs (*suboanw*) if they claimed of having been engaged in start-up activities during the 12 months preceding the survey, being full or part owners of the new business, and if the new business had not paid wages for longer than 3 months. Individuals stating to be managing and owning a business that had paid wages for 3 to 42 months were coded as baby business owners (*babybuso*). In addition to these two variables describing early-stage entrepreneurial activity, individuals were classified as established business owners (*ebo*) if, at the time of the survey, they owned all or part of a business they helped managing, and if the business had paid wages or profits for a period exceeding 42 months. In contrast to nascent entrepreneurs, who are individuals in the process of starting and managing a new business, experienced entrepreneurs are individuals who own and manage a business that has successfully survived in the market and paid an income to the owners for a period of time. This distinction is important since the start-up activities of nascent entrepreneurs do not necessarily lead to the actual creation of a venture and many new businesses fail shortly after inception (Baldwin, 1995; Dunne et al., 1998). Details about the three measurements of entrepreneurial activity are provided in the Appendix.

All three variables indicating participation in one of the three phases of entrepreneurial activity captured by GEM data (*suboanw*, *babybuso* and *ebo*) are binary variables computed at the individual level (individual fits definition “Yes”=1 or “No”=0).³ In our analysis, we focus on racial differences at each of the three steps and test which co-variables play a significant role in explaining these differences.

² Reynolds et al. (2005) provide details on the process and methodology for collection and harmonization of the data.

³ There are no missing values for the variables identifying entrepreneurial activity in the data.

It is important noticing that the variable in our regressions indicating nascent entrepreneurial activity (*suboanw*) is not equivalent to self-employment as defined, for example, by the US Census but rather captures individuals' propensity toward the creation of businesses. Studies of self-employment using US Census data, on the other hand, exclude minor business and start-up activities that do not lead to a major income earning activity of the respondent (Fairlie, 1999; 2004; Fairlie and Meyer, 2000). While all entrepreneurs start as the nascent entrepreneurs described by the *suboanw* variable used in this study, only a few succeed in becoming self-employed in the sense of the US Census (i.e. running a business that constitutes their main income earning activity). Since the goal of the paper is to capture entrepreneurial propensity, we believe our data to be very well suited for the purpose.

In addition to questions identifying whether individuals were involved in entrepreneurial activity at the time of the survey, the dataset contains basic socio-demographics for each respondent, including age, gender, working status, marital status, education level, and household income in 33% brackets with respect to the US national income distribution. Survey participants were also asked three questions related to perceptual variables often associated with entrepreneurial behavior. Specifically, respondents were asked whether they believed to have the knowledge, skill and experience required to start a business (*suskill*), whether they thought that good opportunities for starting a business would exist in the area where they lived in the six months following the survey (*opport*), and whether fear of failing would prevent them from starting a business (*fearfail*). *Suskill* captures the subjective assessment of an individual's self-confidence with respect to entrepreneurial activity and may positively influence her perceived chances of success in starting a business. *Opport* describes a subjective assessment of the existence of opportunities and relates to Kirzner's entrepreneurial "alertness" (Kirzner, 1973; 1979). *Fearfail* describes the degree to which fear of failing affects the behavior of a person with respect to starting a business and can be expected to be negatively correlated to the propensity to starting a business. These 3 variables all describe subjective evaluations and are likely to be biased. In fact, Busenitz and Barney (1992), Cooper et al. (1988), and Koellinger et al. (2005) have shown both empirically and through experiments the existence of entrepreneurial over-confidence.

Finally, respondents were asked whether they knew personally someone who had started a business in the two years preceding the survey (*knowent*). Knowing other entrepreneurs might positively influence the perception of entrepreneurial opportunities by providing social clues in the uncertain environment characterizing the creation of a firm. Thus, knowing other entrepreneurs should be positively correlated to the individual's propensity to start a business (Minniti, 2005). A detailed description of the independent variables is provided in the Appendix.

Our data sample contains a total of 4,900 valid observations. Individuals are classified into four different racial groups: White Americans constitute 78.6% of our sample, black Americans represent 10.3% of our sample, Asian Americans are 2% of the sample, and other racial groups make up 7.4% of the sample.⁴ Overall, GEM data are exceptionally well suited for the purpose of studying differences in entrepreneurial propensity among racial groups in the United States. In addition to being timely, the US GEM survey is unique because it allows us to compare the ethnic profiles of nascent entrepreneurs and experienced entrepreneurs. More importantly, GEM data record individuals who are in the process of starting a new business at the time of the survey and are not the results of ex post evaluations of past decisions. Thus, our data does not suffer from "hindsight bias" (Thaler, 2000).

3 Descriptive results

Table 1 shows the percentage levels of entrepreneurial activity at various stages of development in the US in 2002 by racial groups and the correlation between race and start-up activities. Overall, 6.8% of the sample population was involved in starting a business at the time of the survey (*suboanw*). White Americans are significantly less likely to engage in start-up activities (6.2%) than black Americans (11.1%), compared to 6% among Asian Americans and 8.5% among the remaining racial groups in the US. Thus, black Americans are the racial group with

⁴ 1.7% of the sample (83 observations) have missing values for the race question.

the highest propensity to start a business in the US.⁵ The distribution of racial groups among baby business owners (*babybuso*) is very similar.

Table 1 about here

Again, white Americans are underrepresented, while black Americans show above average prevalence rates. Yet, the distribution of established business owners (*ebo*) among racial groups is reversed. 6.5% of white Americans are experienced entrepreneurs, compared to only 3.4% among black Americans. These differences are highly significant at above 99% confidence. Thus, assuming that start-up activities among racial groups have not dramatically changed prior to 2002, our data suggest that black Americans are more likely to try starting a business but less likely to succeed. Importantly, this does not seem to be the result of a different distribution of entrepreneurial activities of blacks and whites across industry sectors. As shown in Tables A2 through A4 in the Appendix, our data show no significant evidence that blacks are involved in different types of businesses than whites at any stage of the entrepreneurial process (nascent, baby, established).

The result that blacks are less likely to be established business owners than whites is consistent with a number of studies reporting that minorities are less likely to be self-employed (Fairlie, 1999; 2004; Fairlie and Meyer, 1996; 2000; Hout and Rosen, 2000). Most importantly, our results indicate that the gap in self-employment rates may not result from a lack of black Americans willing to try entrepreneurship but, rather, from an over-proportionate failure rate of nascent entrepreneurs and baby business owners in this group.

Table 2 about here

Existing literature suggests that both socio-demographic and perceptual differences among groups of individuals may contribute to explain variations in entrepreneurial propensity (Arenius and Minniti, 2005; Busenitz and Barney, 1997; Cooper et al., 1988; Koellinger et al, 2005). We focus on racial groups. Table 2 shows that significant differences exist in the age distributions of

⁵ Noticeably, results on nascent entrepreneurial activity obtained from 1998-2000 Panel Study of Entrepreneurial Dynamics (PSED) data match our GEM results. Although the PSED criterion for identifying nascent entrepreneurs is slightly different from GEM's, Table 1b shows prevalence rates for ethnic groups that are nearly identical to those shown in the first column of Table 1. **Table 1b about here**

racial groups in the United States. It has been shown that the propensity to start a business increases with age up to a threshold point and decreases thereafter (Blanchflower, 2004) and, specifically, that the propensity to start a business is highest for individuals between 24 and 35 years of age (Reynolds et al., 2003). White Americans are on average older than all other ethnic groups. 18.1% of White Americans in the sample are 55 to 64 years old, compared to 13.7% of black Americans, 6% of Asians, and 7.7% of other ethnic groups. Also, white Americans are underrepresented in the entrepreneurially most active age group of individuals 25-34 years old with just 20.3% falling into that age category, compared to 24.7% of black Americans, 38% of Asian Americans, and 26.9% of the remaining racial groups. Thus, differences in age distribution could explain part of the observed gap in entrepreneurial propensity among US racial groups.

Table 3 about here

Significant differences exist also in educational attainment and work status among races in the United States. The relationship between these differences and entrepreneurial activity, however, is unclear. Table 3 shows that white and Asian Americans have, on average, more schooling than black Americans and other racial groups. 19% of Asian Americans in the sample and 11.2% of white Americans have post college experience, compared to only 5.2% of black Americans and 5.8% of other racial groups. On the other hand, 11.9% of black Americans in the sample are high school dropouts, compared to only 5% of Asians, 6.1% of whites, and 11.9% of the remaining US racial groups. Table 4 shows that significant differences also exist in employment status.

Table 4 about here

White Americans are more likely to have a full or part time job than all other races in the United States. Also, white Americans are less likely to be not working for other reasons than retirement or disability. Black Americans, on the other hand, are overrepresented in the group of individuals having a part-time job only.

Consistently with existing literature, the relationship between entrepreneurship and both, education and work status is unclear. Conditions in the labor market have been identified as an important determinant of employment status choice but the nature of the relationship is still under de-

bate (Bogenhold and Staber, 1993; Acs et al., 1999; Blanchflower and Oswald, 1998).⁶ Education, instead, has been shown to be negatively related to the probability of being self-employed, except in rich countries where post graduate training has been found to have positive effects (Blanchflower, 2004; Reynolds et al., 2003). With respect to race differences, Fairlie (1999) finds that the relationship between education and entry into self-employment is weak for both white and black Americans.

Among socio-economic characteristics, pronounced differences across races exist also in average household incomes where white Americans have, on average, higher household incomes than all other groups. Table 5 shows that white Americans are over-proportionately represented in the upper 33%tile of the US income distribution. The opposite holds for the lowest 33%tile, where all races other than white Americans are over-proportionately represented. Theory suggests that entrepreneurs are significantly hindered by liquidity constraints and that individuals with greater available resources are more likely to enter self-employment (Evans and Jovanovich, 1989; Kihlstrom and Laffont, 1979). Thus, the income advantages of white Americans should increase their propensity to start businesses compared to other racial groups.

Table 5 about here

These and other differences in the distribution of socio-economic variables among racial groups may explain part of the observed gap in entrepreneurial activity. In addition to socio-demographic factors, variables relating to individual perceptions have also been shown to have a crucial impact on the individual decision to start a business (Arenius and Minniti, 2005; Busenitz and Barney, 1997; Forbes, 2005). Consistently with this literature, Table 6 shows that significant differences also exist in perceptual variables among different US racial groups. For example, black Americans are more confident of possessing the sufficient skills, knowledge and experience (*suskill*) to start a business than all other groups. Whites, on the other hand, are more skeptical about their skills, although they are on average better educated (see Table 3).

Table 6 about here

⁶ In general, it is not clear whether high unemployment discourages self-employment by reducing its potential markets or increases it by providing an income producing activity for otherwise displaced workers. Most likely, both effects co-exist and their relative dominance is contingent upon other macroeconomic circumstances.

Also, black Americans are more likely to know other entrepreneurs (*knowent*) and to perceive good business opportunities (*opport*) than white Americans. Finally, white Americans seem more concerned about the possibility of failure (*fearfail*) than all other groups, whereas black Americans are significantly less sensitive to the probability of failure than all other groups. These findings suggest that black Americans tend to have more optimistic subjective perceptions of their business environment than white Americans.

Finally, Table 7 shows correlations between genders and perceptual variables. In general, men are more confident in their skills, knowledge and experience (*suskill*) than women. Also, men are more likely to know other entrepreneurs (*knowent*) and to perceive good business opportunities (*opport*) than women, whereas differences in fear of failure (*fearfail*) between men and women are not statistically significant. Comparing results from Table 6 and Table 7, we see that differences in *suskill*, *knowent*, and *opport* are more pronounced across genders than across racial groups. This suggests that subjective perceptions and their associate biases are more relevant for describing differences across genders than across racial groups.

Table 7 about here

To summarize, black Americans have a higher propensity to start a business and are more likely of being involved in a new one but significantly less likely to be established business owners than white Americans. This difference does not seem to result from differences in the type of industries they enter. Thus, our descriptive results generate two important questions: Why is the involvement of black Americans in the early stages of new venture creation so much higher than white Americans? And why is their exit rate also so much higher? Our descriptive results show the existence of differences in the distribution of racial groups across age cohorts, income, education, work status and subjective perceptions about the business environment that may help answering these questions.

4 Probit models and results

To identify the effects associated with entrepreneurial propensity we estimate probit models (Wooldridge 2002). We calculate a robust covariance matrix of the parameter estimates using the sandwich estimation procedure (White, 1982; Liang, Zeger and Qaqish, 1992). This procedure has the desirable property of yielding asymptotically consistent covariance standard error estimates that are independent from distributional assumptions. The large sample size in our study makes robust covariance estimates particularly attractive (Kauermann and Carroll, 2001).⁷ In addition, preparatory tests revealed only weak correlation of the explanatory variables and no indication for a potential multicollinearity problem in the data.

All independent variables in the models are dummies. The estimated model is a transformed probit model, where the reported coefficients are calculated with a discrete calculation associated with the dummy changing from 0 to 1. Each probit model is calculated as $E(y | \bar{X}_j) = P(y \neq 0 | \bar{X}_j) = \Phi(\bar{X}_j \bar{b})$, where Φ is the cumulative standard normal distribution. The transformed probit models report coefficients $b_i^* = \Phi(\bar{X}_1 \bar{b}) - \Phi(\bar{X}_0 \bar{b})$ where $\bar{X}_0 = \bar{X}_1 = \bar{X}$ except that the i th element of \bar{X}_1 and \bar{X}_0 are set to 1 and 0, respectively. The coefficients have an intuitive interpretation. They indicate the percentage change in the observed outcome if the explanatory variable changes from 0 to 1. In all models, we contrast the dependent variable (*suboanw*, *babybuso*, or *ebo*) against the control group of non-entrepreneurs. For example, the model for nascent entrepreneurs (*suboanw*) excludes individuals who are either new business owners (*babybuso*=1) or established entrepreneurs (*ebo*=1) from the group of non-nascent entrepreneurs (*suboanw*=0) to obtain undistorted estimates of the variables that are different between non-entrepreneurs and nascent entrepreneurs. Running the regression on the entire sample would underestimate the effects of those variables that are similar among nascent and more experienced entrepreneurs, but different for non-entrepreneurs.⁸ The estimated models for new business own-

⁷ Robust variance estimates and significance tests turned out to be nearly equivalent to the parametric estimates in test regressions.

⁸ The results of running regressions on the entire sample, without filtering out new business owners and experienced entrepreneurs, are similar to the results obtained by our approach. The implications of our study are robust to the filtering procedure.

ers and established entrepreneurs exclude household income as an explanatory variable because of potential endogeneity. These models also exclude those respondents who claimed to be not working since it is implausible that individuals owning and managing a business be without work.

Table 8 about here

Table 8 reports our estimation results for all three dependent variables. For each dependent variable, the first model includes only socio-demographic explanatory variables, while the second model also includes the four variables related to individual perceptions (*knowent*, *opport*, *suskill*, and *fearfail*). The results show that the inclusion of perceptual variables increases the fit of the estimated models substantially. In model 1b on nascent entrepreneurial activity (*suboanw*), the perception of good business opportunities (*opport*) and the subjective perception of having sufficient skills, knowledge and experience to start a business (*suskill*) have the highest positive coefficients on the individual propensity to start a business in the US in 2002. Everything else being the same, the perception of good business opportunities (*opport*) increases the individual chance to start a new business by 8.6%, while the perception of having sufficient skills (*suskill*) increases the individual propensity to start a business by 7.1%. Of course, since the causal relationship between perceptions and entrepreneurial activity is unclear, the increased fit of the models including perceptual variables might be due to endogeneity.

Interestingly, the first model, which does not include perceptual variables, shows a significant negative coefficient for the gender dummy. The second model, which includes perceptions, does not show any significant difference between men and women entrepreneurial activity. This suggests that gender differences in start-up activity in the US can be explained by perceptual differences between men and women. Also, individuals with a household income belonging to the middle or upper 33%tile of the US income distribution are significantly more likely to start a business. This also holds for individuals who currently do not work for other reasons than retirement or disability. Finally, estimation results in models 1a and 1b indicate no significant differences in entrepreneurial propensity among whites, Asians, and other non-black Americans. This suggests that members of these groups are comparable in their likelihood to start a business, pro-

vided that they are otherwise equal in terms of age, gender, education, income, and work status. Estimation results, however, suggest a different story when black Americans are considered.

In Model 1a, which only controls for socio-demographic differences, black Americans are on average 6.2% more likely to start a business than otherwise comparable white Americans. Compared to the descriptive evidence in Table 1, which shows a gap in *suboanw* between black and white Americans in the sample of 4.9%, these results imply that the gap in entrepreneurial propensity between blacks and whites would even be greater if the population distribution of the two groups were equal in terms of age, income, gender, education, and work status. In Model 1b, where we control for perceptual differences, although the gap is reduced to 3%, results still indicate a higher entrepreneurial propensity for black Americans. In both models, the coefficient is highly significant.

Overall, our results suggest that the observed gap in entrepreneurial propensity among white and black Americans may be related to perceptual differences, while controlling for socio-demographic factors accentuates the gap. Additional unobserved factors may account for the remaining differences between blacks and whites.⁹

Models 2a and 2b in Table 8 show estimation results for baby business owners (*babybuso*), i.e. those individuals who successfully survived the nascent phase and have established a business that has paid wages, salaries or profits for a period from 3 to 42 months. Controlling for socio-demographic differences, the gaps between blacks and whites are almost identical for both baby business ownership and nascent entrepreneurial activity. This suggests that blacks and whites are equally likely to make the transition into baby business ownership, provided that they are otherwise equal in terms of age, education, marital and working status: Comparing models 1a and 2a shows that blacks are $6.2/7.8 + 1 = 1.79$ times more likely to be nascent entrepreneurs than whites with an identical socio-economic background. Blacks are $3.9/4.8 + 1 = 1.8$ times more likely to be baby-business owners than whites after controlling for socio-economic characteristics. Comparing these results with the descriptive evidence presented in Table 1, which showed that the gap between blacks and whites is smaller for baby business owners than for nascent entrepreneurs in

⁹ A Chow test showed that blacks and whites are poolable in one model, i.e. their estimated coefficients are not significantly different.

absolute terms, suggests that the higher drop-out rate of blacks is not caused by a lack of trying after the initial stages of business ownership. But, rather, it seems to result from the uneven distribution of socio-economic characteristics (e.g. white Americans exhibit better average education levels and higher labor market participation rates compared to blacks). Model 2b, which also controls for perceptual differences, does not show a significant gap between blacks and whites anymore. This suggests that the higher level of self-confidence and optimism of blacks associated with start-up activities in Model 1b may be responsible for the higher presence of blacks in the next step of the entrepreneurial process.

Finally, models 3a and 3b in Table 8 show estimation results for established business owners (*ebo*). Again, consistent with the descriptive evidence in Table 1 we find that blacks are less likely to be established business owners than whites. The coefficient for blacks in both models is significant and approximately equal. This result suggests that, unlike in early-stages of the entrepreneurial process, socio-economic and perceptual variables do not contribute much to explain the gap between black and white established entrepreneurs. In turn, this suggests that external constraints may be responsible for the observed racial gap among established entrepreneurs.

Table 9 about here

In order to assess whether differences between whites and blacks have some gender specific component, we run separate models for men and women by racial group. The results shown in Table 9 emphasize the importance of perceptual variables for the individual decision to start a business. Age, education, and income do not yield significant coefficients in any of the four groups. The perception of good business opportunities (*opport*) and the self-perception of having sufficient skills to start a business (*suskill*) have a strong positive coefficient in all four models. Knowing other entrepreneurs shows a significant positive coefficient for black and white men and black women, while fear of failure (*fearfail*) has a significant negative influence on entrepreneurial propensity of white men only. Although there are some variations in the coefficients among the four groups, the Chow test for equality of the coefficients yields no significant differences among white women and men in the US (empirical Chi2 statistic $12 < 24.77$ theoretical Chi2 statistic at 90% confidence with $df=17$). Also, we do not find significant differences in the coefficients among black American women and men ($12 < 24.77$). Thus, we can conclude that

both genders among black and white Americans respond to similar models and that perceptual variables are strongly correlated with the decision to start a business.

Given the importance of perceptual variables in all three models, we investigated which factors influence these perceptions. Table 10 shows probit estimation results for *suskill*, *opport*, *knowent* and *fearfail*, using socio-economic factors and participation in any of the three stages of entrepreneurial activity as explanatory variables. The results show that the higher levels of *suskill*, *opport*, and *knowent* and the lower level of *fearfail* among blacks cannot be explained by socio-economic factors or entrepreneurial participation alone. In all four models, the coefficient for blacks is highly significant. The results provide also some informal evidence about the causal relationship between perceptual variables and involvement in entrepreneurial activity. For example, the perception to have the sufficient skills, knowledge and experience to start a business peaks in the group of nascent entrepreneurs rather than in the two groups (*babybuso*, *ebo*) of more established business owners who have actually proved to have the skills to establish a business that has survived in the market for some time. This suggests that *suskill* is more likely to be the cause than the result of being engaged in entrepreneurial activity. The same applies for the perception of existing good business opportunities (*opport*). Fear of failure seems to decrease once individuals make the transition from non-entrepreneurs to nascent entrepreneurs, and further to baby business ownership. This suggests that fear of failure may be indeed a barrier to starting a business. Finally, knowing other entrepreneurs seems to be at least partially the result of managing and owning a firm. While nascent entrepreneurs are significantly more likely to know other entrepreneurs than non-entrepreneurs, baby business owners and established business owners are more likely to know someone who recently tried to start a business.

Table 10 about here

5 Discussion and implications

Existing literature has established the existence of significant differences in the rates of entrepreneurial involvement across racial groups in the United States. In particular, blacks are found to have significantly lower self-employment rates than whites. Our data suggest that such differences exist also in the propensity to start businesses. We find black Americans to show an above average propensity to start a business, while white Americans are less likely to engage in business start-ups than our sample average. Our main finding that blacks are more likely to try starting businesses than whites is new and potentially very important as it suggests that constraints and not preferences are behind racial differences in business ownership. Our results are also important as an illustration of the importance of studying early stage entrepreneurial behavior as a way to avoid survival bias.

In our paper we estimate probit models and show that controlling for socio-demographic differences explains observed variations among whites, Asians, and other non-black Americans. Controlling for socio-demographic differences, however, does not explain the gap in entrepreneurial propensity between blacks and whites. In fact, equalizing these variables makes the gap between the two groups wider. On the other hand, our results show that part of this gap can be explained by differences in individual perceptions, i.e. by the fact that black Americans are more self-confident in their entrepreneurial skills, exhibit higher alertness to business opportunities, and are less sensitive to fear of failure. Given the lack of panel data, we are not able to univocally determine the direction of causality between perceptual variables and entrepreneurial activity. However, we find some evidence that these subjective and possibly biased perceptions may contribute to increase entrepreneurial propensity. Regardless of causality, the fact of the matter is that blacks seem to perceive themselves and their entrepreneurial environment in a much more optimistic light than whites.

Although in objective terms the incentives to become self-employed may be lower for black Americans than for white Americans, subjective perceptions may more than compensate for this discrepancy. Our findings about the importance of perceptual variables are consistent with existing literature showing that individuals rely significantly on their perceptions rather than on objective probabilities, evaluate their businesses prospects by taking an overconfident “inside view” of

their situation, and, as a result, overestimate their likelihood of success (Bernardo and Welch, 2001; Kahneman and Lovallo, 1993). In addition, perhaps labor-market discrimination alters the returns to wage work and has an impact on personal characteristics and perceptions, which, in turn, influence the probability of self-employment. Our results are consistent with Walstad and Kourilsky (1998) who investigated the attitudes towards, education in, and knowledge of entrepreneurship of black youth using results from a national survey. Their study found black youth to exhibit a stronger desire to start businesses than white youth, to want more entrepreneurship taught in their schools and to believe successful entrepreneurs have a responsibility to give back to the community. They also suggest that limited access to role models, inadequate knowledge, and discomfort with some of the rationing mechanisms of competitive markets may limit the potential for black youth to realize their entrepreneurial aspirations.

Our results also show that, even after controlling for both socio-economic and perceptual variables, black Americans are still more likely to start a business than white Americans. These results are surprising since it has been shown that the gains from self-employment to minorities are comparatively smaller and, therefore, that minority individuals should have lower incentives to become self-employed (Borjas and Bronars, 1989). Our data do show, however, that a larger percent of blacks than white is employed part-time. The need to complement part time income could be in part responsible for the higher propensity to start businesses among blacks and, perhaps, also for their higher exit rate in the early stages of the venture creation process.

Although we find black Americans to be more likely to engage in start-up activities than white Americans, our results are consistent with existing literature showing that established business ownership is less prevalent among black Americans and other minority groups than among white Americans. This suggests that black Americans have lower success rates or are less likely to complete the start-up process and create a business. Although the issue of different survival rates between black and white business owners is beyond the purpose of our paper, our data provide useful insight by showing that no significant differences exist in the type of businesses started by the two groups. Thus, sectoral differences cannot explain lower survival rates among black early stage business owners.

Much of the literature addressing differences in self-employment rates between black and white Americans stresses geographical concentration, reliance on co-ethnic markets, replacement capital in markets abandoned by indigenous businesses or large firms, and various forms of discrimination. Among them, significant evidence exists suggesting that the actual asymmetry between entrepreneurial survival rates of blacks and whites can be explained, at least in part, by discrimination in the small business credit market. Blanchflower et al. (2001) provide evidence that black-owned businesses in the United States experience higher loan denial probabilities and pay higher interest rates than white-owned businesses even after controlling for differences in creditworthiness and other factors. In addition, Fairlie (1999) finds evidence that the relationship between assets and entry into self-employment appears to be much stronger for blacks than for whites. Along similar lines, using the 1993 National Survey of Small Business Finances, Cavaluzzo et al (2002) find substantial differences in denial rates between firms owned by black Americans and white males. They also find that black American owners were less likely to apply for credit in lending markets characterized by higher concentration (Dymski and Mohanty, 1999). Finally, Bates (1989) finds that racial differences in levels of financial capital partly explain racial patterns in business failure rates. Although our data do not allow us to pursue this line of inquiry, our results are consistent with the idea that external constraint such as those imposed by credit market asymmetries may be responsible, at least in part, for the disproportionately high exit rate of black Americans from self-employment.

Noticeably, the observed patterns in entrepreneurial propensity among racial groups are not idiosyncratic to 2002 US data. We found similar patterns in US GEM data collected in 2003 and 2004. Also, we found a similar pattern in 2002 UK GEM data. Table 11 shows that white UK residents are significantly less likely to start a business than minority groups of Caribbeans and Africans living in the UK. Yet, these minority groups are less likely to be in the group of established business owners.

Table 11 about here

Phizacklea and Ram (1995), for example, report on a comparative examination of entrepreneurship among ten minority businesses in Birmingham. Although based on a very small sample, their study found that all the entrepreneurs had entered business because they had experienced

restricted alternative employment options. All were located in areas of high co-ethnic residential concentration, often with an acute reliance on co-ethnic custom. Similarly, using data from the General Household Survey and the UK 1991 Census, Clark and Drinkwater (1998) found that push factors such as discrimination in paid-employment and pull factors such as minority-specific entrepreneurial opportunities are both relevant in explaining the ethnic dimension of self-employment in the UK labor market and in explaining differences between ethnic groups.

Finally, we hope our results will provide scope for further research. One of the main limitations of our study is our inability to test for causality among variables due to the lack of longitudinal data. As more years of GEM data become available, the application of panel data techniques to the study of these issues may shed light on some important aspects of the relationship between socio-economic conditions, perceptions, and entrepreneurial decisions. Also, evidence supporting or denying our findings in other countries would provide important clues on the type of phenomena under study and its dependency on local conditions. As discussed above, preliminary results from GEM data for the United Kingdom seem to support our findings for the US. In the UK, however, ethnic minorities are often representative of recent waves of immigration. Thus, issues of race and immigration are deeply interconnected. This is not the case for the US where the greatest majority of blacks has been in the country for many generations. Also, high levels of confidence and optimistic perceptions of the business environment in the face of high failure rates suggest that the subjective perceptions of black Americans tend to be biased toward over-optimism more than the perceptions of whites. The question, of course, is why that would be true. Although evidence exist that men tend to be systematically more overconfident than women, to our knowledge, no such evidence exists with respect to racial groups. Intuitively, the existence of external barriers to entrepreneurial success (such as credit asymmetries between black and white Americans) should reduce optimism among blacks and deter entry decisions. Last, even after considering perceptual variables, a portion of the gap in entrepreneurial propensity between black and white Americans remain unexplained. This suggests the existence of other significant variables not yet included in the literature.

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7 Appendix - Data Description

Definition of entrepreneurial activity

The GEM 2002 adult population survey includes a representative sample of the US population.

Included in the survey were:

- Those older than the normal school leaving age
- Urban and rural areas
- All geographic regions of the country
- Those considered in and out of the labor force (housewives, retirees, students were included)

All respondents were asked to three basic questions:

1a. Are you, alone or with others, currently trying to start a new business, including any type of self-employment? (yes, no, don't know, refuse)

1b. Are you, alone or with others, trying to start a new business or a new venture with your employer - an effort that is part of your normal work? (yes, no, don't know, refuse)

1c. Are you, alone or with others, the owner of a company you help manage? (yes, no, don't know, refuse)

Nascent entrepreneurs (suboanw)

Respondents who answered "yes" to items 1a or 1b, were then asked:

2a. You mentioned that you are trying to start a new business. Over the past twelve months have you done anything to help start this new business, such as looking for equipment or a location, organizing a start-up team, working on a business plan, beginning to save money, or any other activity that would help launch a business? (yes, no, don't know, refuse)

2b. Will you personally own all, part, or none of this business? (all, part, none, don't know, refuse)

2c. Has the new business paid any salaries, wages, or payments in kind, including your own, for more than three months? (yes, no, don't know, refused)

Respondents were coded as "nascent entrepreneur" (*suboanw*=1) if, in addition to 1a and 1b, they answered "yes" to 2a and 2b, and "no" to 2c.

New business owners (babybuso)

In order to make the distinction between individuals involved in starting a new business (nascent entrepreneurs) and those involved in managing a very young business (baby business owners), respondents who answered "yes" to question 1c were asked:

3a. You said you were the owner or manager of a company. Do you personally own all, part, or none of this business? (all, part, none, don't know, refuse)

3c. What was the first year the owners received wages, profits, or payments in kind? (4 digit year, or no profits yet, don't know, refuse)

Respondents that classify as full or part owners of the business and had received wages or salaries paid up to 42 months were coded as "baby business owners" (*babybuso*=1).

Established business owners (ebo)

This variable is not part of the original GEM survey and was computed by the authors using GEM data for the purposes of this paper. *Ebo* includes all individuals who own all or part of a business they help to manage, and have paid wages or received profits for more than 42 months.

Independent Variables

All independent variables used in the analysis are described in Table A1. All items were part of the GEM adult population survey questionnaire and were asked to all respondents, independently from whether they were involved in entrepreneurial activities. The socio-demographic variables *gemwork*, *gemhhinc*, and *gemeduc* were not explicitly part of the questionnaire, but were collected as background information for the survey.

Table A1: Variable definition, GEM 2002 US data

Variable (corresponding survey question)	Value
gender	Male
	Female
knowent (Do you know someone personally who started a business in the past 2 years?)	Yes
	No
	Refused
opport (In the next six months will there be good opportunities for starting a business in the area where you live?)	Yes
	No
	Refused
suskill (Do you have the knowledge, skill and experience required to start a new business?)	Yes
	No
	Refused
fearfail (Would fear of failure prevent you from starting a new business?)	Yes
	No
	Refused
working status (Present working status of the individual)	Full / Full or part time
	Part time only
	Retired / disabled
	Not working: other
hhincome (Household income of the individual recoded into thirds relative to country income distribution.)	Lowest 33%
	Middle 33%
	Upper 33%
	Missing
education (Educational attainment of the individual.)	Some secondary schooling
	Secondary degree
	Post secondary degree
	Grad exp
	Missing
age – (What year were you born?)	18-24 yrs old
	24-34 yrs old
	35-44 yrs old
	45-54 yrs old
	55-64 yrs old

Base: United States N = 4,900

Sectoral distribution of entrepreneurial activity

In order to analyze the sectors in which people attempt to start businesses and compare their distribution across sectors with those of established business, GEM codes activity according to the International Standard Industry Codes (ISIC)¹⁰. These codes identify more than five hundred

¹⁰ ISIC is an international statistical standard to classify firms according to the main activity they carry out. ISIC is supported by the members of the United Nations and widely adopted and used across countries. It also corresponds with the Statistical Classification of Economic Activities in the European Community (NACE Rev.1.1). See <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=17>.

different types of activity, which GEM consolidates under four main headings for ease of analysis. These sectoral groups are:

- Extraction: agriculture, forestry, fishing, and mining (i.e., extraction of products from the natural environment)
- Transformation: construction, manufacturing, transportation, and wholesale distribution (physical transformation or relocation of goods and people)
- Business Services: where the primary customer is another business
- Consumer Oriented: where the primary customer is a physical person (e.g. retail, restaurants and bars, lodging, health, education, social services, recreation).

The following three tables show the sectoral distribution of nascent entrepreneurs, baby business owners, and established business owners by race. According to Chi-square tests in all three tables, there are no significant differences across the four racial groups in the sectoral distribution of their entrepreneurial activities.

Table A2: Nascent entrepreneurs

	Extractive	Transforming	Business services	Consumer oriented
White (N=223)	5.4%	27.4%	23.3%	43.9%
Black (N=52)	3.8%	15.4%	32.7%	48.1%
Asian (N=5)	0.0%	60.0%	20.0%	20.0%
Other (N=29)	6.9%	10.3%	20.7%	62.1%
Sample Average (N=309)	5.2%	24.3%	24.6%	46.0%
Chi2 = 12.507 (df=9); asymptotic significance (2-sided) = 0.186.				

Table A3 : Baby business owners

	Extractive	Transforming	Business services	Consumer oriented
White (N=115)	5.2%	35.7%	20.0%	39.1%
Black (N=23)	4.3%	30.4%	13.0%	52.2%
Asian (N=3)	0.0%	33.3%	33.3%	33.3%
Other (N=13)	7.7%	38.5%	7.7%	46.2%
Sample Average (N=154)	5.2%	35.1%	18.2%	41.6%
Chi2 = 3.151 (df=9); asymptotic significance (2-sided) = 0.958.				

Table A4: Established business owners

	Extractive	Transforming	Business services	Consumer oriented
White (N=185)	14.6%	29.7%	23.8%	31.9%
Black (N=13)	0.0%	15.4%	30.8%	53.8%
Asian (N=1)	0.0%	0.0%	100.0%	0.0%
Other (N=16)	12.5%	18.8%	31.3%	37.5%
Sample Average (N=215)	13.5%	27.9%	25.1%	33.5%
Chi2 = 8.708 (df=9); asymptotic significance (2-sided) = 0.465.				

Table 1: Pearson correlations between race and entrepreneurial activity in the USA 2002, individuals 18-64 yrs old

	SUBOANW Nascent entrepreneurs	BABYBUSO Baby business owners	EBO Established business owners
White (N=3,850)	-0.054** (6.2%)	-0.024* (3.7%)	0.041** (6.5%)
Black (N=503)	0.058** (11.1%)	0.029* (5.6%)	-0.037** (3.4%)
Asian (N=100)	-0.005 (6.0%)	-0.007 (3.0%)	-0.006 (5%)
Other (N=364)	0.019 (8.5%)	0.007 (4.4%)	-0.016 (4.7%)
Sample Average (N=4,900)	6.8%	3.9%	6%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=4,817 valid observations

Table 1b: Pearson correlations between race and nascent entrepreneurial activity in the USA 1998-2000 according to PSED data, individuals 18-64 yrs old

	Nascent entrepreneurs
White (N=52,225)	-0.038** (6.5%)
Black (N=5,907)	0.046** (10.4%)
Asian (N=1,110)	-0.010* (5.1%)
Other (N=3,742)	0.010* (7.9%)
Sample Average (N=52,571)	6.9%

Note: ** denotes significance at >99%, * denotes significance at >95%, unweighted observed frequencies in (), N=51,996 valid observations

Table 2: Pearson correlations between race and age in the USA 2002, individuals 18-64 yrs old

	age1824	age2534	age3544	age4554	age5564
White (N=3,850)	-0.110** (12.1%)	-0.064** (20.3%)	0.024* (24.2%)	0.058** (25.4%)	0.080** (18.1%)
Black (N=503)	0.059** (20.1%)	0.025* (24.7%)	-0.021 (21.1%)	-0.029* (20.5%)	-0.026* (13.7%)
Asian (N=100)	0.017 (18%)	0.058** (38%)	-0.006 (22%)	-0.028* (16%)	-0.041** (6%)
Other (N=364)	0.09** (25%)	0.037* (26.9%)	-0.010 (22.3%)	-0.040** (18.1%)	-0.068** (7.7%)
Sample Average (4,900)	14.1%	21.7%	23.7%	24.1%	16.4%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=4,817 valid observations

Table 3: Pearson correlations between race and educational attainment in the USA 2002, individuals 18-64 yrs old

	Grade school	High school, no degree	High school, with degree	Post high school, no degree	College degree	Post college experience
White (N=3,850)	-0.025* (1.7%)	-0.079** (6.1%)	-0.028* (32.1%)	0.026* (25.6%)	0.019 (23.2%)	0.057** (11.2%)
Black (N=503)	-0.006 (1.6%)	0.063** (11.9%)	0.048** (39.4%)	-0.022 (22.3%)	-0.026* (19.7%)	-0.058** (5.2%)
Asian (N=100)	0.013 (3%)	-0.012 (5%)	-0.049** (17%)	-0.010 (22%)	0.039** (34%)	0.041** (19%)
Other (N=364)	0.038** (3.6%)	0.053** (11.9%)	0.013 (34.9%)	-0.008 (23.8%)	-0.020 (19.9%)	-0.042** (5.8%)
Sample Average (N=4,875)	1.8%	7.2%	32.7%	25.1%	22.9%	10.3%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=4,817 valid observations

Table 4: Pearson correlations between race and working status in the USA 2002, individuals 18-64 yrs old

	Full or part time job	Part time job only	Retired / disabled	Not working: other
White (N=3,850)	0.026* (63.8%)	-0.028* (11.1%)	0.028* (9.1%)	-0.030* (16%)
Black (N=503)	-0.036* (58.1%)	0.031* (14.5%)	0.003 (8.9%)	0.018 (18.5%)
Asian (N=100)	-0.010 (60%)	0.016 (15%)	-0.019 (5%)	0.014 (20%)
Other (N=364)	0.009 (64.6%)	-0.002 (11.3%)	-0.035* (5.2%)	0.017 (18.8%)
Sample Average (N=4,873)	63.2%	11.6%	8.7%	16.5%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=4,817 valid observations

Table 5: Pearson correlations between race and household income in the USA 2002, individuals 18-64 yrs old

	Lowest 33%tile	Middle 33%tile	Upper 33%tile
White (N=3,400)	-0.109** (20%)	-0.016 (35.5%)	0.108** (44.5%)
Black (N=455)	0.094** (33.6%)	0.028 (39.8%)	-0.106** (26.6%)
Asian (N=86)	0.031* (31.4%)	-0.041** (22.1%)	0.014 (46.5%)
Other (N=324)	0.04* (28.1%)	0.014 (38.3%)	-0.047** (33.6%)
Sample Average	22.3%	35.9%	41.8%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=4,265 valid observations

Table 6: Pearson correlations between race and perceptual variables in the USA 2002, individuals 18-64 yrs old

	SUSKILL(yes)	KNOWENT(yes)	OPPORT(yes)	FEARFAIL(yes)
White	-0.031* (55.8%)	-0.044* (35.2%)	-0.026* (36.4%)	0.055** (22.7%)
Black	0.05** (63.8%)	0.039** (41.7%)	0.030* (41.3%)	-0.060** (14.3%)
Asian	-0.019 (50%)	-0.001 (36%)	-0.019 (30.7%)	0.022 (27.8%)
Other	0.00 (56.5%)	0.021 (39.8%)	0.014 (39.3%)	-0.026* (17.8%)
Sample Average	56.6%	36.2%	37%	21.5%
N	N=4,732	N=4,803	N=4,279	N=4,751

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in ()

Table 7: Pearson correlations between gender and perceptual variables in the USA 2002, individuals 18-64 yrs old

	SUSKILL(yes)	KNOWENT(yes)	OPPORT(yes)	FEARFAIL(yes)
Female	-0.158** (48.9%)	-0.093** (31.8%)	-0.096** (32.2%)	0.024 (22.4%)
Male	0.158** (64.6%)	0.093** (40.7%)	0.096** (41.5%)	-0.024 (20.4%)
Sample Average	56.6%	36.1%	36.9%	21.4%
N	N=4,813	N=4,886	N=4,357	N=4,832

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in ()

Table 8: Probit estimates for entrepreneurial activity in the US– 2002

Probit estimates	Y = nascent entrepreneurs (suboanw)				Y = baby business owners (babybuso)				Y = established business owners (ebo)			
	Model 1a		Model 1b		Model 2a		Model 2b		Model 3a		Model 3b	
	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z
age25-34	0.046*	0.005	0.022	0.068	0.010	0.411	0.008	0.298	0.024	0.174	0.007	0.626
age35-44	0.030	0.066	0.015	0.237	0.005	0.637	0.004	0.632	0.068*	0	0.040*	0.009
age44-54	0.001	0.96	-0.011	0.322	-0.013	0.244	-0.003	0.711	0.060*	0.001	0.040*	0.008
age55-64	-0.001	0.973	-0.003	0.845	-0.012	0.365	-0.000	0.999	0.107*	0	0.079*	0
Female	-0.035*	0	-0.010	0.118	-0.028*	0	-0.009*	0.031	-0.029*	0	-0.010	0.082
education(hs, no degree)	0.002	0.969	-0.021	0.423	-0.153	0.570	-0.006	0.798	-0.009	0.807	-0.020	0.405
education(hs degree)	0.015	0.703	-0.021	0.457	-0.000	0.997	0.004	0.883	0.013	0.719	-0.006	0.835
education(post-hs, no degree)	0.049	0.265	-0.008	0.785	0.008	0.798	0.006	0.842	0.023	0.555	-0.007	0.809
education(college degree)	0.043	0.33	-0.010	0.717	0.024	0.449	0.013	0.668	0.014	0.716	-0.011	0.686
education(grad exp)	0.033	0.47	-0.017	0.517	0.022	0.514	0.009	0.774	0.028	0.507	-0.003	0.924
Working status(part-time job only)	0.020	0.178	0.008	0.448	0.024*	0.021	0.014	0.051	0.020	0.082	0.020*	0.037
Working status(retired/disabled)	-0.003	0.866	-0.002	0.913	-0.037*	0.003	-0.020*	0.004	-0.060*	0	-0.043*	0
Working status(not working:other)	0.028*	0.026	0.025*	0.012								
hhincome(middle 33%)	0.033*	0.009	0.024*	0.018								
hhincome(upper 33%)	0.027	0.05	0.011	0.283								
Married(yes)	-0.017	0.062	-0.013	0.058	0.014*	0.034	0.005	0.283	0.011	0.124	0.009	0.126
USethnic(black)	0.062*	0	0.030*	0.006	0.039*	0.001	0.012	0.085	-0.027*	0.029	-0.028*	0.001
USethnic(asian)	-0.005	0.855	0.006	0.778	-0.016	0.401	0.004	0.777	-0.031	0.181	-0.026	0.204
USethnic(other)	0.026	0.107	0.002	0.883	0.009	0.446	0.003	0.699	-0.000	0.982	-0.006	0.553
knowent(yes)			0.026*	0			0.036*	0			0.034*	0
oport(yes)			0.086*	0			0.037*	0			0.017*	0.006
suskill(yes)			0.071*	0			0.026*	0			0.052*	0
fearfail(yes)			-0.006	0.458			-0.015*	0.002			-0.016*	0.019
Model diagnostics												
Number of obs	3,925		3,410		3,556		3,069		3,610		3,117	
Prob > chi2	0.000		0.000		0.000		0.000		0.000		0.000	
Pseudo R2	0.0375		0.2083		0.055		0.2136		0.064		0.167	
Log likelihood	-1,037		-770		-651		-483		-791		-625	
Observed P	0.0782		0.0827		0.048		0.051		0.063		0.065	
Predicted P at x-bar	0.0711		0.0404		0.039		0.019		0.049		0.033	

Reference categories: age18-24, male, gemeduc(some secondary or less), working status(full or part-time job), household income(lowest 33%), useethnic(white).

*: Coefficient significant at 95%.

** : dF/dx is for discrete change of dummy variable from 0 to 1.

Note: All models contrast individuals of the dependent variable category against the group of non-entrepreneurs. Observations that are coded as other types of entrepreneurs than the ones included in the dependent variable category are dropped from the respective regression.

Table 9: Probit estimates for nascent entrepreneurial activity among white and black Americans by gender – 2002

Probit regressions	Y = suboanw							
	White Males		White Females		Black Males		Black Females	
	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z
age25-34	0.009	0.633	0.020	0.299	0.060	0.429	0.034	0.454
age35-44	-0.001	0.963	0.023	0.244	0.008	0.916	0.011	0.81
age44-54	-0.025	0.151	-0.003	0.876	0.064	0.394	-0.013	0.733
age55-64	-0.013	0.565	0.001	0.939	0.069	0.517	-0.017	0.715
education(secondary degree)	0.017	0.482	-0.017	0.261	-0.016	0.825	0.025	0.605
education(post secondary)	0.029	0.202	-0.014	0.407	0.050	0.511	0.041	0.378
education(grad exp)	0.008	0.793	-0.018	0.264	0.172	0.221	0.237	0.096
working status(part-time job only)	0.011	0.654	0.012	0.339	-0.019	0.736	-0.021	0.536
working status(retired/disabled)	0.006	0.816	-0.003	0.881	-0.046	0.559	0.001	0.989
working status(not working:other)	0.025	0.237	0.026*	0.019	-0.023	0.699	-0.001	0.986
hhincome(middle 33% income)	0.026	0.194	0.020	0.099	0.067	0.218	-0.027	0.362
hhincome(upper 33% income)	0.013	0.506	0.005	0.693	-0.020	0.749	-0.039	0.124
married(yes)	-0.021	0.093	-0.005	0.595	-0.097*	0.015	0.046	0.1
knowent(yes)	0.037*	0.002	0.007	0.42	0.138*	0.004	0.068*	0.014
opport(yes)	0.086*	0	0.077*	0	0.093*	0.039	0.078*	0.012
suskill(yes)	0.075*	0	0.053*	0	0.103*	0.015	0.110*	0.001
fearfail(yes)	-0.030*	0.02	0.004	0.692	0.076	0.299	0.033	0.406
Model diagnostics								
Number of obs	1,324		1,347		180		191	
Prob > chi2	0.000		0.000		0.004		0.001	
Pseudo R2	0.1966		0.2139		0.2534		0.3036	
Log likelihood	-327		-234		-58		-49	
Observed P	0.092		0.058		0.156		0.12	
Predicted P at x-bar	0.048		0.026		0.079		0.039	
Reference categories: age18-24, gemeduc(some secondary or less), working status(full or part-time job), household income(lowest 33%).								
*: Coefficient significant at 95%.								
**: dF/dx is for discrete change of dummy variable from 0 to 1.								
Note: All models contrast nascent entrepreneurs against the group of non-entrepreneurs - observations that are coded as experienced entrepreneurs (<i>experi</i>) or new business owners (<i>babybuso</i>) are excluded.								

Table 10: Probit estimates for perceptual variables – 2002

Probit estimates	Y = suskill		Y = knowent		Y = oport		Y = fearfail	
	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z	dF/dx**	P> z
age25-34	0.060*	0.029	0.010	0.699	-0.028	0.31	0.014	0.534
age35-44	0.099*	0	-0.043	0.102	-0.007	0.818	-0.011	0.628
age44-54	0.058*	0.036	-0.097*	0	-0.040	0.156	-0.020	0.365
age55-64	0.082*	0.01	-0.152*	0	-0.086*	0.007	-0.062*	0.012
Female	-0.144*	0	-0.061*	0	-0.073*	0	0.016	0.239
education(hs, no degree)	0.135*	0.033	0.158*	0.037	0.169*	0.035	0.012	0.83
education(hs degree)	0.191*	0.001	0.154*	0.028	0.173*	0.019	0.019	0.715
education(post-hs, no degree)	0.240*	0	0.193*	0.007	0.227*	0.003	0.041	0.449
education(college degree)	0.242*	0	0.212*	0.003	0.258*	0.001	0.031	0.568
education(grad exp)	0.205*	0.001	0.226*	0.003	0.245*	0.002	0.041	0.478
working status(part-time job only)	-0.027	0.296	0.007	0.783	0.005	0.861	0.011	0.594
working status(retired/disabled)	0.005	0.872	-0.020	0.543	-0.041	0.243	-0.044	0.102
working status(not working:other)	-0.037	0.107	-0.021	0.353	-0.009	0.72	0.010	0.595
hhincome(middle 33%)	0.065*	0.003	0.074*	0.001	0.004	0.868	-0.006	0.729
hhincome(upper 33%)	0.067*	0.005	0.134*	0	0.048	0.053	-0.013	0.479
married(yes)	0.013	0.451	-0.024	0.152	0.040*	0.026	0.008	0.576
USethnic(black)	0.108*	0	0.075*	0.003	0.053*	0.048	-0.091*	0
USethnic(asian)	-0.023	0.684	-0.023	0.669	-0.063	0.28	0.023	0.611
USethnic(other)	0.031	0.302	0.052	0.079	0.058	0.062	-0.049*	0.035
nascent	0.342*	0	0.191*	0	0.388*	0	-0.038	0.13
babybuso	0.301*	0	0.345*	0	0.319*	0	-0.102*	0.002
Ebo	0.330*	0	0.249*	0	0.225*	0	-0.099*	0
Model diagnostics								
Number of obs	4,186		4,247		3,800		4,198	
Prob > chi2	0.000		0.000		0.000		0.000	
Pseudo R2	0.0986		0.0698		0.0804		0.0187	
Log likelihood	-2,577		-2,605		-2,313		-2,170	
Observed P	0.5710		0.3706		0.3755		0.22	
Predicted P at x-bar	0.5917		0.3639		0.3718		0.2148	
Reference categories: age18-24, male, gemeduc(some secondary or less), working status(full or part-time job), household income(lowest 33%), useethnic(white), no entrepreneur.								
*: Coefficient significant at 95%.								
**: dF/dx is for discrete change of dummy variable from 0 to 1.								

Table 11: Pearson correlations between ethnicity and entrepreneurial activity in the UK 2002, individuals 18-64 yrs old

	SUBOANW – Nascents	BABYBUSO – Baby business owners	EBO - Established business owners
UK White (N=11,631)	-0.029** (2%)	-0.035** (2.4%)	0.011 (5.8%)
UK Caribbean (N=63)	0.051** (12.7%)	0.003 (3.2%)	-0.017* (0%)
UK African (N=61)	0.028** (8.2%)	0.039** (11.5%)	-0.007 (3.3%)
UK Asian (N=205)	0.011 (3.4%)	0.022* (5.4%)	-0.005 (4.9%)
UK Other (N=57)	-0.01 (0%)	0.019* (7.0%)	0.004 (7%)
UK Sample Average (N=12,837)	2.2%	2.6%	5.7%

Note: ** denotes significance at >99%, * denotes significance at >=90%, unweighted observed frequencies in (), N=12,837 valid observations