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Behind the GATE Experiment: Evidence on Effects of and Rationales for Subsidized Entrepreneurship Training

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ABSTRACT

We use randomized program offers and multiple follow-up survey waves to examine the effects of entrepreneurship training on a broad set of outcomes. Training increases short run business ownership and employment, but there is no evidence of broader or longer run effects. We also test whether training mitigates market frictions by estimating heterogeneous treatment effects. Training does not have strong effects (in either relative or absolute terms) on those most likely to face credit or human capital constraints, or labor market discrimination. Training does have a relatively strong short-run effect on business ownership for those unemployed at baseline, but not at other horizons or for other outcomes.

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1. Introduction

Governments and donors spend billions of dollars subsidizing entrepreneurship training programs around the world.[1] Arguments for subsidizing training are manifold, and span theories of allocative and/or redistributive frictions in credit, labor, insurance, and human capital markets. But such arguments have been difficult to evaluate empirically due to classic endogeneity problems from selection into training.[2]

We test whether self-employment training mitigates market or redistributive frictions by estimating heterogeneous treatment effects from randomly assigned offers of free entrepreneurship training in the largest and broadest social experiment on entrepreneurship training ever conducted in the United States, and to our knowledge, any other country in the world.[3] The U.S. Department of Labor and the Small Business Administration (SBA) created Project Growing America through Entrepreneurship (GATE) to evaluate the effectiveness of offering free training to any individual interested in starting or improving a business (Benus et al. 2009). More than four thousand individuals applied for a limited number of slots for free

[1] See http://fieldus.org/Publications/2008/index.html and http://www.sba.gov/content/small-business-development-centers-sbdcs for directories of entrepreneurship training programs in the United States. For a description of programs in the European Union, see e.g. European Commission (2010).

[2] For example, see Ashenfelter (1978) and LaLonde (1986) for seminal work on identification problems in job training. Card et al's (2010) recent meta-analysis of the job training evaluation literature finds no statistically significant mean differences between experimental and non-experimental impacts. There has been much less work evaluating the effects of entrepreneurship training.

[3] Benus et al (1994) evaluates results from a demonstration experiment on self-employment training for U.I recipients in Washington and Massachusetts, and finds some evidence of large positive impacts on self-employment, total earnings, and job creation. A number of recent studies use randomized experiments to evaluate impacts of business training on micro-entrepreneurs in developing countries (Field, Jaychandran, and Pande 2010; Berge, Bjorvatn, and Tungooden 2011; Drexler, Fischer, and Schoar 2011; Karlan and Valdivia 2011). These studies have generally found some positive, but mixed, results. One key external validity issue when comparing across (developing vs. more-developed country) settings is how labor market differences affect sample composition; e.g., in many developing-country settings, access to formal labor markets may be limited in the long-run as well as the short-run. For recent non-randomized approaches to identifying effects of self-employment training programs, see, e.g., Kosanovich and Fleck (2001), Rodriguez-Planas (2010), Almeida and Galasso (2010), and Oosterbeek, van Praag and Ijsselstein (2010).

entrepreneurship training services at training providers including SBA-funded Small Business Development Centers (SBDCs) and non-profit community-based organizations (CBOs) located across 7 sites in 3 states. SBDCs and CBOs are the predominant providers of entrepreneurship training services in the U.S. market.[4]

Subjects assigned to the treatment group were offered an array of best-practice training services. Subjects assigned to the control group were not offered any free services. The nine-page application form yields a rich set of baseline data, and an examination of these data confirms that assignment to treatment was orthogonal to baseline characteristics. Project follow-up surveys at 6 and 18, and 60 months after treatment assignment yield a rich set of outcome measures. The 60 month follow-up survey provides rare measures of long-run outcomes.

The GATE assignment to treatment produced a 126 percent short-term increase and a 33 percent long-term increase in the amount of training received. Recipients reported the training as useful in follow-up surveys, and the treatment group was 11-13 percentage points more likely to create a business plan and 2-6 percentage points more likely to start a business. These results offer reassurance that any null effects on more ultimate outcomes are not simply due to a weak treatment (lack of compliance, quality, intensity, etc.).

We examine GATE's impacts on a broad range of more ultimate outcomes. Prior work focuses on the average training impacts on the unemployed and finds some evidence of positive effects on business starts, employment and total earnings in the long run (Michaelides and Benus 2010). To test hypotheses regarding rationales for training interventions, we examine several additional heterogeneous treatment effects and their implications for whether and why it makes

[4] The Aspen Institute lists more than more than 650 non-profit programs providing training, technical assistance, and/or loans to entrepreneurs in the United States. SBDCs exist in all 50 states, and more than one million small businesses and entrepreneurs utilize these resources. The SBA provided $128 million in FY 2009 in grant funding for these programs.

sense to subsidize training. We also examine a broader range of outcomes in our impacts analysis of average as well as heterogeneous treatment effects. In addition, we conduct a new set of robustness checks for the effects of differential attrition (treated subjects were 4-5 percentage points more likely to complete the follow-up surveys), and examine treatment and control group compliance and distributional effects on business sales and employment.

Our results on average treatment effects across the entire sample suggest that GATE significantly increased the likelihood of business ownership at 6-months (5pp on a base of 0.36) but not thereafter.[5] There is a more modest increase in overall employment at 6-months (3pp), suggesting some substitution between self-employment and wage/salary employment. We find no evidence, however, of average treatment effects on other outcomes, including measures of business performance, household income, and work satisfaction at any horizon. We also show that the estimates are not overly sensitive to reasonable assumptions about how attrition affects the composition of the treatment vs. control groups.

We also provide novel results on heterogeneous treatment effects, using these interactions to shed light on the empirical importance of various rationales offered for training subsidies. Credit constraints are one rationale offered for training subsidies: if training is valuable but potential recipients lack the liquidity to pay for it, offering low-cost training may be a cost-effective way (compared to, say, subsidizing lending) to improve access. But we do not find any evidence that training has lasting effects, or relatively strong effects, on those who report having bad credit or no credit. Another rationale for training subsidies is human and managerial capital constraints: if education or managerial labor markets do not function well, then low-cost training may improve efficiency or efficiently redistribute to the most affected parties. But we do not find strong

[5] The point estimates fall from 5pp at the 6-month follow-up, to 2pp at the 18-month follow-up, to 0-1pp at the 60-month follow-up.

evidence that training has lasting effects, or relatively strong effects, on those with low education, less family business experience, or less managerial experience.

Labor market discrimination is a third rationale for training subsidies: if minorities face greater discrimination from employers than from customers or lenders, then subsidizing training may be a relatively efficient method for redistributing to groups affected by discrimination in the labor market. But we do not find any evidence that training has lasting effects, or relatively strong effects, for minorities or women. In fact, treatment effects on business ownership are significantly *lower* for women at both the 6- and 18-month follow-ups.

Unemployment insurance frictions are a fourth rationale for training subsidies: training may be a relatively efficient way to insure against job loss by providing recipients with incentives to work by creating a job for themselves (and perhaps others). We find limited support for this hypothesis: the GATE treatment effect on business ownership at 6-months was significantly greater for those who were initially unemployed compared with those who were employed at baseline. But we do not find any other evidence of relatively strong effects for the unemployed, nor do we find any evidence of lasting effects for the unemployed.

The rest of the paper proceeds as follows. Section 2 provides more details on GATE, including its research design and implementation, the nature of the training services received by subjects, and GATE's average impacts on business planning and starts. Section 3 presents our results on more ultimate outcomes of interest (business ownership, employment, business sales, having employees, household income, and work satisfaction) with a focus on using heterogeneous treatment effects to test hypotheses about the (redistributive) efficiency of self-employment training. Section 4 concludes.

2. The Growing America through Entrepreneurship (Project GATE) Experiment

a. Evaluation and Treatment Design

Growing America through Entrepreneurship (Project GATE) was an evaluation designed and implemented by the U.S. Department of Labor and U.S. Small Business Association. The GATE experiment is the largest-ever randomized evaluation of entrepreneurship training and assistance involving more than four thousand participants. It differs from earlier large-scale evaluations in the United States because its training was marketed to any individual interested in starting or growing a business, and not limited to individuals receiving unemployment or welfare benefits.[6]

GATE was administered between September 2003 and July 2005 in seven cities of varying sizes: Philadelphia; Pittsburgh; Minneapolis/St. Paul; Duluth, Minnesota; Virginia, Minnesota; Portland, Maine; Lewiston, Maine; and Bangor, Maine. Both urban and rural populations were served by the sites. Fourteen different organizations provided the GATE training, including SBA-funded Small Business Development Centers and non-profit community-based organizations. All of the providers and their programs had been operating prior to the experiment.

Training providers marketed GATE to a broad group of potential entrepreneurs with an extensive campaign that included public service announcements, paid advertisements, and flyers and posters at One-Stop Career Centers. Individuals interested in receiving training had to first attend an orientation meeting at one of the 21 participating One-Stop Career Centers in the seven GATE cities. Anyone attending the orientation meeting was then eligible to apply for GATE by completing a nine-page application form with questions on demographics, work and business

[6] Demonstration programs in Washington and Massachusetts starting in 1989, and Self-Employment Assistance programs in several states starting in 1993, targeted unemployment insurance recipients. The Self-Employment Investment Demonstration, implemented from 1988 to 1992 in five states, targeted AFDC recipients.

experience, and the individual's current business or new business idea. Applicants were informed that "GATE does not have space for everyone" and that a "lottery or random drawing will decide whether you will be able to enter the program."

Program coordinators reviewed applications for completeness and then randomly assigned all complete applications to the treatment or control group with equal probability. The treatment group was offered an array of free services. Program administrators informed the control group that the GATE program did not have the capacity to offer them services, and administrators offered no referrals to other (free) services either. Individuals in both groups were notified that they would be mailed follow-up surveys in 6, 18, and 60 months.

The array of GATE services offered to the treatment group began with a one-on-one assessment meeting to determine an individual's specific training needs. Then training was provided by experienced business consultants in classroom and/or one-on-one settings. Classroom offerings targeted a variety of general and specialized topics at different experience levels.[7] One-on-one counseling was designed to provide advice that was customized to the individual's experience, capability, circumstances, and opportunities. GATE "training" was always offered as this bundle/menu of services, and hence we cannot disentangle the effects of its different components. Benus et al. (2009) estimate that the total cost of providing training to GATE recipients was between $850 and $1,300 per person.

B. Sample Characteristics and External Validity

For the study, 4,197 individuals completed the application process and were randomly assigned to the treatment (N = 2,094) or control (N=2,103) group. Among participants, 19

[7] Introductory courses cover subjects such as legal structure, business plans, and marketing. Intermediate and advanced courses cover subjects including managing growth, legal risks, and personnel issues. More specialized courses covered, e.g., accounting, information technology, and web-based businesses.

percent were self-employed and 39 percent were receiving unemployment insurance (UI) benefits at the time of the application. GATE participants do not differ substantially from the U.S. entrepreneurial population in demographic characteristics such as race, gender, age, marital status and education (Benus et al., 2009). Given these characteristics and GATE's mass marketing, GATE treatment effects plausibly apply to a broad population of entrepreneurs and potential entrepreneurs who are interested in training. GATE's filters, which included attending the orientation session and completing the application, imply that its external validity is questionable for populations more marginally interested in training; e.g., for those who would only participate if some other benefit was conditioned on participation or if particularly aggressive marketing techniques were employed.

C. Randomization Integrity and Differential Attrition

Table 1 starts by comparing mean baseline characteristics across the treatment and control groups. Random assignment was not stratified by site, but each site produced roughly 50-50 assignments nevertheless. Among the numerous baseline characteristics measured in the application, only one, age, is statistically different between treatment and control. One would expect to find one or two significant differences by chance, and the magnitude of the age difference is small (< 1 year). In any case, when estimating treatment effects we present results both without covariates as well as with controls for a large set of detailed baseline characteristics.

Table 1 also compares treatment and control completion rates and baseline characteristics for each of the three follow-up surveys. Control group members are significantly more likely to attrit: the completion rate differs by 4-5 percentage points on a base of 56-80 percent for each follow-up wave. However, despite differential attrition rates overall, we do not find differences

in the observable composition of the treatment versus control groups, based on characteristics observed in the baseline. The number of significant differences is about what one would expect to find by chance, and the magnitude of these differences is small. More formally, in a regression of follow-up survey completion on baseline characteristics, treatment status, and baseline characteristics interacted with treatment status, the F-tests on the interaction variable coefficients have p-values of 0.214 for Wave 1, 0.823 for Wave 2, and 0.091 for Wave 3. Despite this reassurance, we investigate how treatment effects might be biased if there is in fact differential attrition (e.g., on unobservables) in Section 3.E below.

D. Empirical Strategy

Our main specification for estimating average treatment effects uses simple means comparisons or OLS intent-to-treat estimates, conditional on all of the baseline covariates shown in Table 1. When estimating heterogeneous treatment effects we add a set of interactions between baseline covariates and treatment assignment to the model.

E. Treatment Effects on Services Received, Business Planning, and Trying Business Ownership

Given that the control group was not restricted from obtaining training elsewhere, it is important to examine whether and how the GATE treatment actually changed the use of training and business planning. Table 2 shows that the treatment group was an estimated 37 percentage points more likely to receive any training in the 6 months following random assignment than the control group.[8]

[8] Examining who receives entrepreneurship training, we find only a few characteristics that predict take up of training by each follow-up wave. Focusing on the main effects we find some evidence that African Americans and the more educated are more likely to receive training (see Appendix Table 1). Examining

The treatment group also received more than twice the number of hours of training by the first follow-up wave. The difference in training received is 9 hours at Wave 1 and 7 hours summing across waves. Drexler et al. (2011) find substantial effects on business practices and outcomes from only a few hours of extra training among microcredit users in the Dominican Republic. Additionally, the extra hours of classroom and one-one-one counseling training time may have translated into considerably more hours spent researching, writing business plans, and doing "homework" by the participant for the business idea.

Follow-up survey responses also indicate that GATE participants were satisfied with services (Appendix Table 2). 51.7 percent of GATE recipients reported that "the overfull usefulness" of the services received was "very useful", with 33.7 percent responding "somewhat useful". Most recipients of GATE training responded that services helped "a lot" or "somewhat" with at least one specific aspect of the business or business planning (e.g., marketing strategy, accounting, networking, information technology). The treatment group reports greater satisfaction overall, and for each of the training aspects, than control group trainees (who obtained non-GATE training of their own accord). These responses, along with the experience, best-practice approach, and scale of the service providers (e.g. the SBA-funded SBDCs), suggest that any null effects are not due to low-quality training that is particular to GATE.

Table 3 shows that GATE affected some business planning and practice outcomes as well. Treated individuals were 13 percentage points more likely to have written a business plan by Wave 1, and this difference persists over time. This translates, to a relatively small degree, into participants trying business ownership: there are significant differences of 4 and 5 percentage points at the 6- and 18-month follow-ups. By 60-months the difference shrinks to 2.5

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differential take up between the treatment and control groups, we find only a few significant differences. F-tests for differential take up for all covariates do not reject equality in any of the three follow-up waves.

percentage points, with a p-value of 0.135. We do not find any differences in loan applications, however, on a low base; e.g., only 6 percent of the treatment and control groups applied for a business loan by Wave 1.

3. Treatment Effects on More Ultimate Outcomes

A. Average Effects on Business Ownership and Performance

We start by examining the average impacts on business ownership at each follow-up wave. Table 4 reports estimates. For the treatment group, 40.1 percent are self-employed business owners at the 6-month follow-up survey. This rate of business ownership is 5.2 percentage points higher (conditional on baseline covariates) than for the control group. At the 18-month follow-up, the treatment effect point estimate remains positive, but the difference of 2.2 percentage points is smaller (control group mean = 0.41) and no longer statistically significant. Sixty months after random assignment, the treatment and control groups have nearly identical levels of business ownership. The positive effects of entrepreneurship training on business ownership appear to die out over time.[9]

Before examining additional outcomes, we briefly examine treatment effects on the dynamics of business entry and exit in Appendix Table 3. Given that the treatment and control groups start with roughly equal ownership rates (Table 1), any differences in business ownership rates at each of the follow-up survey waves are due to differences in business creation rates, differences in business exit rates, or both (Fairlie 1999). The second panel of Appendix Table 3 shows that,

[9] The results are not due to the influence of side or casual businesses, or disguised unemployment (Carter and Sutch 1994). Defining business ownership with 30 or more hours worked per week, we find lower rates of business ownership, but similar treatment-control differences: the treatment group has a 4.2 percentage point higher rate of full-time business ownership than the control group at Wave 1, dropping to 1.8 percentage points at Wave 2, and dropping to essentially zero at Wave 3. We also restrict business ownership to only include businesses reporting positive sales at each survey wave to remove non-serious self-employment activities. Again, we find similar results.

conditional on not owning a business at baseline, treatment group members were far more likely to have started a business 6 months later. This effect dissipates over time. The third panel of Appendix Table 3 shows that, conditional on owning a business at baseline, we do not find any significant differences in exit rates. Thus the treatment effect is driven primarily by a difference in business starts, not exits.

Overall, the estimates indicate that entrepreneurship training increased average levels of business ownership in the short-run. Entrepreneurship training appears to have drawn new people into starting businesses but did not increase the survival rates of pre-existing businesses. The effects of entrepreneurship training disappear in the long run, however. This implies that the marginal businesses produced by entrepreneurship training do not survive in the medium/long-run.[10] Indeed, the estimated average null treatment effects on sales and employees (Table 4) suggest that the marginal businesses had low levels of sales and generally did not hire employees. The positive Wave 1 average treatment effect on business ownership is not accompanied by positive average treatment effects on business sales or the likelihood of having an employee. Nor do we find significant treatment effects on sales or employees at longer horizons. The results for employment do not differ when we change the focus from having an employee to the number of employees (Appendix Table 4). Results are similar for other measures of business performance, including profits, alternative measures of business income, and summary indices that standardize and aggregate across outcomes (Kling, Liebman, and Katz 2007). These estimates are also reported in Appendix Table 4.[11]

[10] Treatment effects do not vary with local economic conditions. We estimate specifications that include the unemployment rate, and treatment interacted with the unemployment rate (with unemployment varying by MSA and year/month), and find no evidence of heterogeneity conditional on underlying unemployment in the local economy.

[11] The business outcome summary index actually shows a small *negative* treatment effect in the long-run.

B. Effects on Firm Size Distribution?

Table 5 explores whether the average treatment effect analysis might obscure important effects on the firm size distribution. We focus here on long-run (Wave 3: 60-month) outcomes, for treatment vs. control, and for both all businesses and business started post-treatment. Both the sales and employee distributions show that our sample has fewer large businesses than the United States as a whole. This is partly due to the five-year study period as the distributions are more similar when we examine all U.S. businesses created in the past 5 years (reported in the final column). Focusing on the treatment vs. control comparisons, we do not find that businesses created by the treatment group are more likely to be very successful than businesses created by the control group. In fact, slightly less than two percent of businesses owned by the treatment group have sales of $500,000 or more, compared with more than four percent of businesses owned by the control group. The difference is statistically significant and remains after controlling for baseline characteristics. The treatment-control difference, however, is less clear when we focus on other sales level cutoffs and when we focus on high levels of employment. We also do not find a significant difference between the full treatment and control distributions reported in Table 5 using a chi-square test. Overall, we do not find evidence that entrepreneurship training increased the likelihood of creating high-revenue or high-employment firms five years post-random assignment.

C. Average Effects on Overall Employment, Household Income, and Work Satisfaction

Returning to Table 4, we also estimate treatment effects on broader outcomes: the likelihood of being employed (wage/salary work or business ownership), household income, and work satisfaction (which we use as a proxy for potential non-pecuniary benefits of employment or self-

employment).[12] The positive 6-month effect on employment suggests that the business ownership effect does not fully crowd-out wage/salary work. Because the treatment effect on business ownership was larger at 4.6 percentage points about half of the short-run increase in business ownership resulted in higher overall employment rates for the treatment group. The other half of the increase in business ownership rates was a substitution away from wage/salary work. Similar to the business ownership effect, the effect on overall employment dissipates over time. For income and work satisfaction, we do not find significant effects at any horizon.[13]

D. Compliance and Local Average Treatment Effects

To gauge how much larger treatment estimates are when we focus on estimating the effects of *receiving* entrepreneurship training (i.e. "treatment-on-the-treated" or local average treatment effects) instead of estimating the effects of being *offered* free entrepreneurship training (i.e. "intent-to-treat" effects), we estimate instrumental variables regressions. As reported in Table 2, 18.8 percent of the treatment group did not receive any entrepreneurship training in the first 6 months after random assignment and 44.0 percent of the control group received at least some entrepreneurship training in the 6 months after random assignment. To account for both types of non-compliance and estimate the effects of *receiving* entrepreneurship training on business outcomes, we estimate the following two-stage regression. The first-stage regression for the probability of receiving any entrepreneurship training is:

(3.2) $E_i = \omega + \gamma X_i + \pi T_i + u_i$.

The second-stage regression for the outcome of interest, y, is:

[12] See, for example, Hamilton (2000) and Kawaguchi (2004).

[13] We also estimate treatment effects on total earnings by combining separately reported business earnings and wage/salary earnings (as opposed to direct reports of total household income). We do not find any significant treatment effects on this measure either. Nor do we find any significant effects on reliance on public assistance.

(3.3) $y_i = \alpha + \beta X_i + \Delta \hat{E}_i + \varepsilon_i$,

where X_i includes baseline characteristics, T_i is the treatment indicator, $\hat{E}_i$ is the predicted value of entrepreneurship training from (3.2), and u_i and ε_i are error terms. Δ provides an estimate of the local average treatment effect.

The IV estimates are reported in Appendix Table 5 for the six main outcomes reported in Table 4.[14] As expected given the non-compliance rates, the point estimates are generally scaled up by a factor of 2 to 3 over the "intent-to-treat" estimates reported in Table 4. None of our statistical inferences change. The LATE estimates indicate that receiving entrepreneurship training increases business ownership by 13.5 percentage points and overall employment by 7 percentage points at Wave 1. There is no strong evidence of effects on long-term business ownership or other outcomes.

E. Exploring the Impact of Differential Attrition on the Estimates

Although we do not find strong evidence of differential attrition based on observables in Section 2.C above, or that treatment effect estimates are sensitive to the inclusion of controls for baseline characteristics (Table 4), follow-up survey response rates are higher in the treatment group for each of the follow-up waves, raising the concern that attrition may be correlated with unobserved heterogeneity in outcomes as well. To investigate whether differential attrition might have a large effect on the results we follow two different approaches. First, we estimate regressions for our main set of outcomes using the predicted probability of attrition as a sample weight. The full set of baseline controls are used to estimate these predicted probabilities. This

[14] Appendix Table 5 also reports estimates of non-experimental correlations between receiving entrepreneurship training and our key outcomes. For these regressions we include only the control group sample and control for all of the baseline characteristics reported in Table 1. For most of the business outcomes, we find large positive relationships with entrepreneurship training. These estimates, which may be subject to selection bias, are substantially larger than the LATE estimates from the experiment.

technique places more weight on survivors who look like attriters, in an attempt to compensate for the attriters' absence. The estimates are robust to using these weights (Table 6 vs. Table 4).

Second, we conduct a bounds analysis using various assumptions about the treatment effects for attriters in the spirit of Horowitz and Manski (2000) and Lee (2009; 2002). Table 7's Column 4 reproduces the relevant average treatment effect estimate from Table 4. Following Kling et al (2007) and Karlan and Valdivia (2011), we impute to the lower (upper) bound the mean minus (plus) a specified standard deviation multiple of the observed treatment group distribution to the non-responders in the treatment group, and the mean plus (minus) the same standard deviation multiple of the observed control group distribution to non-responders in the control group. In Column 3, for example, we create a conservative treatment effect estimate by assuming that treatment group attriters have the mean value for the dependent variable minus 0.05 standard deviations among non-attriting treatment observations, and that the control group attriters have the mean value for the dependent variable plus 0.05 standard deviations among the non-attriting control observations.

Table 7 indicates that the results are not overly sensitive to adding and subtracting 0.05 standard deviations from the means, but are sensitive to moving 0.25 standard deviations from the means (Columns 1 and 7). To put the magnitudes of these changes in perspective, Table 7 also reports the treatment and control standard deviations in Columns 8 and 9, respectively (the treatment and control means are reported in Table 4). For business ownership at Wave 1, for example, the -0.05 adjustment reported in Column 4 assumes that the attriting treatment group has a 2.5 percentage point lower business ownership rate than the non-attriting treatment sample and that the attriting control group has a 2.4 percentage point higher business ownership rate than

the non-attriting control sample. These are large changes from a base business ownership rate of roughly 35 to 40 percent and yet do not result in major changes in the results.[15]

If we focus on the disappearance of the 5 percentage point short-run treatment effect by the 60 month follow-up survey, we find it would take an extreme form of biased attrition to regenerate the treatment effect in the long run. For the treatment effect to be 5 percentage points at the 60-month follow-up it would require that the attritors in the treatment group have more than a 0.10 standard deviation higher business ownership rate than non-attritors and attritors in the control group have more than a 0.10 standard deviation lower business ownership rate than non-attritors.

Columns 5-7 of Table 7 also show the particular and strong form that attrition would need to take to create positive effects on outcomes other than short-run business ownership and employment. It would have to be the case that treatment group attritors have substantially more positive treatment effects, and/or that control group attritors have substantially more negative treatment effects, than non-attritors..Thus, it appears as though attrition would have to be very non-random to lead to substantially different results than what we find.

F. Hypothesis Testing Based on Heterogeneous Treatment Effects

To shed light on the rationale for training subsidies, we next explore heterogeneous treatment effects in the data. We estimate these effects by adding several interactions between key baseline characteristics and treatment status to our model of conditional average treatment effects (i.e., we estimate each heterogeneous effect of interest conditional on the others). As such, each row in Table 8A presents results from a single regression. We also estimate average treatment effects on

[15] We also estimate bounds using the trimming procedure suggested in Lee (2002, 2009). The estimated range is similar to that reported for 0.10 standard deviations for most outcome measures.

sub-samples of key groups in Table 8B, to address the policy question of whether training benefits targeted groups in levels if not relative terms.

Credit constraints are one important rationale for training subsidies: if training is valuable but potential recipients lack access to financing, subsidizing training may be a way to overcome credit market failures that hinder business starts. If this is the case we might expect training to have relatively strong, positive effects on the credit constrained, conditional on other characteristics. The baseline application asks: "Do you have any problems with your credit history?" We interact this variable with treatment status and do not find any evidence that training has *relatively* strong or lasting on those with credit problems (Table 8A, Column 4). When we examine the credit constrained sub-sample alone, we also do not find evidence of positive treatment effects with only the treatment coefficient for Wave 1 business ownership being statistically significant (Table 8B, Column 3). We also estimate whether entrepreneurship training differentially affects the level of invested capital in the business for those with credit problems (results not reported). We do not find any evidence that the treatment affects investment, debt, or loan applications, overall or differentially for the credit constrained.

Labor market discrimination is another potential rationale for training subsidies: if employers discriminate more than customers, then low-cost training may be a relatively efficient method for redistributing to affected groups. [16] But we do not find evidence that training has relatively strong or lasting effects for minorities or women (Table 8A, Columns 2 and 3). In fact, treatment effects on business ownership are significantly *lower* for women at 6- and 18-months, producing main effects on business ownership for the female sub-sample that are not statistically significant (Table 8B, Column 3).

[16] See Borjas and Bronars (1989) and Fairlie and Robb (2008) for a discussion of customer and other forms of discrimination against minority business owners. See Altonji and Blank (1999) for a review of the literature on racial and gender discrimination in the labor market.

Human and managerial capital constraints are another important rationale for training subsidies: if education or managerial labor markets do not function well, then subsidizing training may improve efficiency or efficiently redistribute to the most-affected parties. But we do not find strong evidence that training has relatively lasting or strong effects on those with less education, less previous managerial experience, or less experience working in a family business.[17]

Unemployment insurance frictions are perhaps the most important, or at least most commonly invoked, rationale for training subsidies. Training may be a relatively efficient way to insure against job loss by providing recipients with incentives to work by creating a job for themselves (and perhaps others).[18] We test this by interacting treatment status with a measure of initial unemployment. We find that those who were initially unemployed are more likely to have a business at the 6-month follow-up (Table 8A, Column 5 and Table 8B, Column 4). The effect on business ownership, however, disappears and we find no effect in the long-run. We also do not find any other evidence of strong or lasting effects for the unemployed, in either relative (Table 8A) or absolute (Table 8B) terms.[19] The results for the unemployed also do not change if we examine treatment effects relative to only those who are initially wage/salary workers.

[17] These are the main human capital factors found to be associated with business success in the literature (Parker 2009 and Fairlie and Robb 2008).

[18] An alternative explanation for why the unemployed may benefit more from job training is that they have more time to devote to it. But we do not find any evidence that the unemployed (at baseline) receive more or different training.

[19] As noted above, Michaelides and Benus (2010) find a few significant results on an unemployed sub-sample (defined by participants reporting "looking for work" at the time of the application). We use a slightly broader definition of unemployment to include anyone who is not working in a wage/salary job or self-employed at the time of application. Participating in the GATE program implies some level of interest in work, and our definition facilitates a straightforward classification of our sample into mutually exclusive categories of unemployment, wage/salary work, and self-employment.

4. Conclusion

Although a substantial amount of money is spent on subsidizing entrepreneurship training around the world, we know very little about its effectiveness and whether it alleviates market frictions. We provide new estimates on the average and heterogeneous treatment effects of entrepreneurship training from Project GATE, the largest and broadest entrepreneurship training experiment ever conducted. We find evidence that the training increased average business ownership in the short-run, but that the marginal businesses were unsuccessful and failed to produce tangible or subjective benefits at any of the three follow-up horizons (6-, 18-, and 60-months). We also find no evidence that training shifts the distribution of firms in important ways (e.g., disproportionately creating very successful firms) that might be missed by analysis of average treatment effects. Although we find higher attrition among the control group, bounds analyses confirm that only extreme forms of biased attrition would change these results.

Our analysis of treatment heterogeneity produces some novel insights about the theory and design of training interventions. Many of the rationales put forward for subsidizing training—countering credit or human capital constraints in enterprise development, or labor market discrimination—are not borne out by the data. We do find evidence that GATE's training had relatively strong positive effects on business ownership for the unemployed in the short run, but these effects disappear by the long run. These findings, and the estimated costs of providing training to GATE recipients of $850 to $1,300, suggest that entrepreneurship training may not be a cost-effective method of addressing credit, human capital, discrimination, or employment constraints.

The results here also speak to the importance of understanding which components of training are more and less helpful, and for which populations. Should subsidies for entrepreneurship

training be re-allocated to job training? Should content from entrepreneurship training be grafted onto job training? Understanding more about the effects and mechanisms of entrepreneurship training is particularly important given the continued growth and popularity of these programs around the world. Many financial institutions with a social aim now bundle business training with their loans, the U.S. Department of Labor recently funded a new round of GATE programs in four additoinal states, and President Obama recently signed the Small Business Jobs Act which expands funding to SBDCs throughout the country.

References

Almeida, Rita K., and Emanuela Galasso. 2010. "Jump-starting Self-employment? Evidence for Welfare Participants in Argentina." *World Development* 38 (5): 742-755.

Altonji, Joseph, and Rebecca Blank. 1999. Race and Gender in the Labor Market. In *Handbook of Labor Economics, Volume 3C*. New York, NY: Elsevier.

Ashenfelter, Orley. 1978. "Estimating the Effect of Training Programs on Earnings." *Review of Economics and Statistics* 60 (1): 47-57.

Benus, Jacob, Terry R. Johnson, Michelle Wood, Noelima Grover, and Theodore Shen. 1994. *Self-Employment Programs: A New Reemployment Strategy (Final Impact Analysis of the Washington and Massachusetts Self-Employment Demonstrations)*. December.

Benus, Jacob, Theodore Shen, Sisi Zhang, Mark Chan, and Benjamin Hansen. 2009. *Growing America Through Entrepreneurship: Final Evaluation of Project GATE*. December.

Berge, Lars, Kjetil Bjorvatn, and Bertil Tungooden. 2011. Human and financial capital for microenterprise development: Evidence from a field and lab experiment. January.

Borjas, George, and Stephen Bronars. 1989. "Consumer Discrimination and Self-Employment," *Journal of Political Economy* 97: 581-605.

Card, David, Jochen Kluve, and Andrea Weber. 2010. "Active Labour Market Policy Evaluations: A Meta-Analysis." *The Economic Journal* 120 (November): F452-F477.

Carter, Susan B., and Richard Sutch. 1994. Self-employment in the Age of Big Business: Toward an Appreciation of an American Labor Market Institution.

Drexler, Alejandro, Greg Fischer, and Antoinette Schoar. 2011. Keeping it Simple: Financial Literacy and Rules of Thumb. January.

European Commission. 2010. *European Employment Observatory Review: Self-employment in Europe*.

Fairlie, Robert. 1999. "The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment." *Journal of Labor Economics* 17 (1): 80-108.

Fairlie, Robert, and Alicia Robb. 2008. *Race and Entrepreneurial Success: Black-, Asian-, and White-Owned Businesses in the United States*. Cambrige, MA: MIT Press.

Field, Erica, Seema Jaychandran, and Rohini Pande. 2010. "Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India." *American Economic Review Papers and Proceedings* 100 (2): 125-129.

Hamilton, Bart. 2000. "Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment." *Journal of Political Economy* 108: 604-631.

Horowitz, Joel, and Charles Manski. 2000. "Nonparametric Analysis of Randomized Experiments with Missing Covariate and Outcome Data." *Journal of the American Statistical Association* 95 (449): 77-84.

Karlan, Dean, and Martin Valdivia. 2011. "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions." *Review of Economics and Statistics* 93 (2): 510-527.

Kawaguchi, Daiji. 2004. Positive, Non-Earnings Aspects of Self-Employment: Evidence from Job Satisfaction Scores.

Kling, Jeffrey, Jeffrey Liebman, and Lawrence Katz. 2007. "Experimental Analysis of Neighborhood Effects." *Econometrica* 75 (1) (January): 83-120.

Kosanovich, William T., and Heather Fleck. 2001. *Final Report: Comprehensive assessment ofself-employment assistance programs*. June.

LaLonde, Robert J. 1986. “Evaluating the Econometric Evaluations of Training Programs with Experimental Data.” *American Economic Review* 76 (4): 604-620.

Lee, David S. 2002. “Trimming for Bounds on Treatment Effects with Missing Outcomes.” *NBER Technical Working Paper 277*.

———. 2009. “Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects.” *Review of Economic Studies* 76: 1071-1102.

Michaelides, Marios, and Jacob Benus. 2010. Are self-employment training programs effective? Evidence from Project GATE. February.

Oosterbeek, Hessel, Mirjam van Praag, and Auke Ijsselstein. 2010. “The impact of entrepreneurship education on entrepreneurship skills and motivation.” *European Economic Review* 54: 442-454.

Rodriguez-Planas, Nuria. 2010. “Channels through which Public Employment Services and Small Business Assistance Programmes Work.” *Oxford Bulletin of Economics and Statistics* 72 (4): 458-485.

Table 1: Treatment/Control Comparison of Characteristics for GATE Experiment

	Baseline			Follow-up Wave 1			Follow-up Wave 2			Follow-up Wave 3		
	Treatment Group	Control Group	P-Value for Treat-Control	Treatment Group	Control Group	P-Value for Treat-Control	Treatment Group	Control Group	P-Value for Treat-Control	Treatment Group	Control Group	P-Value for Treat-Control
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Philadelphia	28.7%	27.5%	0.40	26.8%	25.6%	0.43	25.1%	24.0%	0.49	23.1%	22.0%	0.53
Pittsburgh	13.8%	14.6%	0.43	13.7%	14.3%	0.58	14.0%	14.2%	0.82	14.5%	14.4%	0.92
Minneapolis-St. Paul	39.8%	39.0%	0.58	41.1%	39.1%	0.24	42.3%	40.4%	0.29	43.9%	42.0%	0.35
Duluth	4.6%	5.0%	0.54	4.6%	5.1%	0.51	4.7%	5.1%	0.60	5.0%	4.9%	0.99
Maine	13.1%	13.9%	0.48	13.9%	15.9%	0.09	14.0%	16.3%	0.08	13.6%	16.7%	0.03
Female	47.2%	45.7%	0.32	48.5%	46.4%	0.22	48.8%	46.9%	0.31	48.1%	47.1%	0.62
Black	30.5%	30.6%	0.91	29.1%	29.8%	0.65	27.6%	28.3%	0.69	25.3%	26.0%	0.70
Latino	6.2%	5.1%	0.12	6.3%	4.9%	0.09	6.4%	5.1%	0.12	6.4%	5.2%	0.19
Asian	4.6%	4.5%	0.86	3.8%	3.3%	0.42	3.3%	2.9%	0.52	3.1%	2.8%	0.71
Other	7.9%	8.1%	0.80	7.7%	7.6%	0.91	7.4%	7.0%	0.64	7.4%	6.6%	0.47
Not U.S. born	10.0%	10.2%	0.83	8.9%	9.2%	0.81	8.3%	8.7%	0.67	7.1%	8.1%	0.34
Age	42.08	42.77	0.03	42.73	43.42	0.04	43.16	43.81	0.07	43.91	44.16	0.54
Married	48.1%	48.4%	0.81	49.4%	48.6%	0.64	50.2%	49.0%	0.54	51.4%	49.6%	0.38
Has children	46.7%	46.1%	0.68	45.4%	45.1%	0.88	45.4%	44.6%	0.69	44.0%	42.8%	0.58
Highest grade completed	14.39	14.52	0.07	14.53	14.61	0.28	14.59	14.66	0.38	14.75	14.78	0.77
HH Income $25,000-49,999	32.6%	33.7%	0.46	33.0%	34.0%	0.56	32.9%	33.4%	0.77	31.9%	34.5%	0.18
HH Income $50,000-74,999	17.9%	17.2%	0.55	18.5%	17.5%	0.45	19.2%	17.8%	0.31	20.1%	17.2%	0.06
HH Income $75,000-99,999	6.9%	7.2%	0.70	7.1%	7.2%	0.91	7.4%	7.3%	0.92	8.1%	7.4%	0.53
HH Income $100,000+	6.3%	7.0%	0.31	6.9%	7.4%	0.56	7.5%	8.0%	0.59	8.8%	8.9%	0.96
Self-Emp. at appplication	18.3%	19.5%	0.33	19.3%	20.4%	0.41	19.8%	21.2%	0.34	20.3%	21.5%	0.48
Has a health problem	8.7%	8.3%	0.63	9.0%	8.9%	0.90	9.1%	8.9%	0.85	8.9%	8.4%	0.69
Has relatives or friends who have been previously S.E.	70.3%	70.4%	0.93	71.7%	72.0%	0.85	72.9%	72.5%	0.81	73.6%	73.1%	0.78
Ever worked for relatives or friends who are S.E.	31.7%	32.0%	0.81	31.7%	31.8%	0.96	31.6%	31.7%	0.97	30.9%	31.5%	0.77
Has a bad credit history	45.4%	43.9%	0.34	43.3%	43.2%	0.94	41.8%	41.5%	0.87	38.9%	39.4%	0.79
Currently receiving UI benefits	39.9%	38.1%	0.24	41.1%	39.7%	0.40	42.1%	39.3%	0.12	43.0%	41.1%	0.35
Has health insurance from current employer	16.8%	18.1%	0.26	16.6%	17.5%	0.48	16.6%	17.6%	0.46	16.8%	17.1%	0.84
Autonomy index	1.7%	-1.7%	0.27	-1.1%	-1.9%	0.81	-0.7%	-1.7%	0.79	-2.0%	-4.9%	0.49
Risk tolerance index	-0.2%	0.2%	0.87	2.6%	-1.1%	0.27	1.3%	-2.0%	0.34	-0.7%	-4.4%	0.35
Unemployed at application	55.3%	55.4%	0.92	55.0%	55.5%	0.78	55.5%	54.6%	0.63	55.8%	55.4%	0.85
F-Test for all variables			0.56			0.53			0.69			0.80
Sample Size	2,094	2,103		1,758	1,691		1,563	1,475		1,274	1,176	
Percent of baseline sample size	100.0%	100.0%		84.0%	80.4%	0.003	74.6%	70.1%	0.001	60.8%	55.9%	0.001

Notes: (1) All reported characteristics are measured at time of application, prior to random assignment. (2) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application.

Table 2: Receipt of Entrepreneurship Training

	Random Assignment to Wave 1		Wave 1 to Wave 2		Wave 2 to Wave 3	
	Percent Receiving	Mean Hours	Percent Receiving	Mean Hours	Percent Receiving	Mean Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment group						
Any entrepreneurship training	81.2%	15.6	41.5%	7.3	26.1%	4.6
Attended classes, workshops or seminars	66.8%	13.8	35.0%	6.6	22.1%	4.0
Received one-on-one counseling or technical assistance	52.5%	1.8	18.0%	0.8	10.0%	0.6
Control group						
Any entrepreneurship training	44.0%	6.9	37.9%	8.0	28.7%	5.7
Attended classes, workshops or seminars	37.7%	6.1	32.7%	7.4	25.1%	5.2
Received one-on-one counseling or technical assistance	19.2%	0.9	13.8%	0.7	10.3%	0.6

Notes: (1)The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application.

Table 3: Impact of Entrepreneurship Training on Business Practices

	Treatment	N	Control	N	Treatment-Control	
					No Covars	Covariates
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Wrote a business plan by W1	0.5000	1752	0.3725	1686	0.1275	0.1276
					(0.0168)	(0.0172)
Wrote a business plan by W2	0.5974	1555	0.4666	1468	0.1308	0.1296
					(0.0180)	(0.0185)
Wrote a business plan by W3	0.6761	1266	0.5662	1171	0.1100	0.1108
					(0.0196)	(0.0200)
Applied for a business loan by W1	0.0592	1756	0.0627	1691	-0.0035	-0.0035
					(0.0082)	(0.0084)
Applied for a business loan by W2	0.0962	1560	0.0916	1473	0.0045	0.0008
					(0.0106)	(0.0109)
Applied for a business loan by W3	0.1457	1270	0.1549	1175	-0.0092	-0.0152
					(0.0145)	(0.0150)
Ever been or tried business ownership after exp. by W1	0.6285	1755	0.5853	1688	0.0432	0.0458
					(0.0166)	(0.0162)
Ever been or tried business ownership after exp. by W2	0.7458	1562	0.6918	1473	0.0541	0.0582
					(0.0163)	(0.0161)
Ever been or tried business ownership after exp. by W3	0.8028	1273	0.7749	1173	0.0279	0.0247
					(0.0165)	(0.0165)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Treatment-contol differences with covarariates are estimated from a linear probability model that controls for program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance.

Table 4: Impact of Entrepreneurship Training on Business Ownership and Main Outcomes

	Treatment	N	Control	N	Treatment-Control	
					No Covars	Covariates
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Business owner at W1 survey date	0.4056	1753	0.3592	1690	0.0464	0.0517
					(0.0166)	(0.0153)
Business owner at W2 survey date	0.4307	1558	0.4091	1474	0.0216	0.0208
					(0.0179)	(0.0172)
Business owner at W3 survey date	0.3888	1273	0.3794	1173	0.0095	0.0025
					(0.0197)	(0.0194)
Employed (bus own or wage/salary) at W1 survey date	0.7856	1754	0.7604	1690	0.0253	0.0271
					(0.0143)	(0.0139)
Employed (bus own or wage/salary) at W2 survey date	0.8449	1560	0.8243	1474	0.0206	0.0194
					(0.0135)	(0.0132)
Employed (bus own or wage/salary) at W3 survey date	0.7834	1274	0.7993	1171	-0.0160	-0.0189
					(0.0164)	(0.0161)
Monthly business sales at W1 survey date (000s)	1.4225	1631	1.8288	1579	-0.4063	-0.3691
					(0.2821)	(0.2880)
Monthly business sales at W2 survey date (000s)	1.9471	1447	2.1327	1347	-0.1856	-0.1396
					(0.3534)	(0.3528)
Monthly business sales at W3 survey date (000s)	2.4138	1212	2.9092	1111	-0.4954	-0.6204
					(0.5385)	(0.5563)
Has any employees at W1 survey date	0.0852	1748	0.0722	1690	0.0131	0.0140
					(0.0092)	(0.0095)
Has any employees at W2 survey date	0.0978	1554	0.0939	1469	0.0039	0.0020
					(0.0107)	(0.0110)
Has any employees at W3 survey date	0.0931	1267	0.1104	1169	-0.0172	-0.0209
					(0.0123)	(0.0128)
Log household income at W1	10.2821	1648	10.3061	1575	-0.0239	-0.0088
					(0.0319)	(0.0251)
Log household income at W2	10.4061	1438	10.3708	1359	0.0353	0.0195
					(0.0357)	(0.0293)
Log household income at W3	10.5558	1178	10.5018	1092	0.0541	0.0217
					(0.0415)	(0.0353)
Work satisfaction: "very satisfied" at W1	0.5167	1732	0.5170	1677	-0.0003	0.0060
					(0.0171)	(0.0176)
Work satisfaction: "very satisfied" at W2	0.4938	1541	0.4893	1451	0.0045	0.0092
					(0.0183)	(0.0188)
Work satisfaction: "very satisfied" at W3	0.5136	993	0.5038	931	0.0098	0.0117
					(0.0228)	(0.0236)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Treatment-contol differences with covarariates are estimated from a linear probability model that controls for program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance. (3) The Wave 3 sample for work satisfaction is restricted to include only the employed.

Table 5: Distribution of Firms by Annual Sales and Number of Employees, Treatment Group, Control Group and U.S. Total

	Treatment Group		Control Group		U.S. Firms SBO (2007)	
	All	New	All	New	Total	Started 2002-07
	(1)	(2)	(3)	(4)	(5)	(6)
Annual sales and receipts						
Less than $5,000	24.9%	26.6%	23.5%	23.5%	20.6%	22.4%
$5,000 to $9,999	9.7%	10.1%	13.1%	12.8%	13.7%	13.8%
$10,000 to $24,999	16.6%	13.0%	18.0%	17.5%	18.8%	18.6%
$25,000 to $49,999	17.3%	18.0%	12.0%	13.7%	12.1%	12.9%
$50,000 to $99,999	14.3%	12.6%	15.1%	14.1%	9.9%	10.7%
$100,000 to $249,999	11.5%	13.0%	9.9%	11.1%	10.2%	10.6%
$250,000 to $499,999	3.9%	4.7%	4.2%	3.4%	5.5%	5.0%
$500,000 to $999,999	0.9%	1.1%	1.8%	1.7%	4.0%	3.2%
$1,000,000 or more	0.9%	1.1%	2.4%	2.1%	5.2%	3.0%
Employment size						
No employees	75.9%	74.0%	70.8%	72.2%	81.1%	85.0%
1 to 4 employees	18.6%	20.0%	22.7%	22.0%	10.6%	10.0%
5 to 9 employees	3.1%	3.8%	3.4%	2.2%	3.7%	2.6%
10 to 19 employees	1.6%	1.6%	1.8%	2.2%	2.3%	1.4%
20 to 49 employees	0.6%	0.6%	0.5%	0.4%	1.4%	0.8%
50 to 99 employees	0.2%	0.0%	0.5%	0.7%	0.5%	0.2%
100 employees or more	0.0%	0.0%	0.5%	0.4%	0.4%	0.1%
Sample size	434	278	383	234		

Notes: (1) U.S. total is from the Survey of Business Owners 2007, U.S. Census Bureau, and includes all non-farm businesses with sales of at least $1,000 in 2007. (2) New businesses are individuals who did not own a business at the time of application to the program.

Table 6: Impact of Entrepreneurship Training on Main Outcomes Weighted by Predicted Non-Response Probabilities

	Treatment-Control Difference	
	No Covars	Covariates
Dependent Variable	(1)	(2)
Business owner at W1 survey date	0.0363	0.0442
	(0.0182)	(0.0165)
Business owner at W2 survey date	0.0116	0.0208
	(0.0197)	(0.0183)
Business owner at W3 survey date	-0.0147	-0.0143
	(0.0216)	(0.0208)
Employed (bus own or wage/salary) at W1	0.0199	0.0213
survey date	(0.0170)	(0.0161)
Employed (bus own or wage/salary) at W2	0.0192	0.0188
survey date	(0.0162)	(0.0153)
Employed (bus own or wage/salary) at W3	-0.0217	-0.0223
survey date	(0.0189)	(0.0180)
Monthly business sales at W1 survey date	-566	-490
	(328)	(313)
Monthly business sales at W2 survey date	-177	-121
	(362)	(358)
Monthly business sales at W3 survey date	-667	-633
	(527)	(514)
Has any employees at W1 survey date	0.0087	0.0102
	(0.0100)	(0.0098)
Has any employees at W2 survey date	-0.0001	0.0002
	(0.0118)	(0.0114)
Has any employees at W3 survey date	-0.0172	-0.0190
	(0.0140)	(0.0139)
Log household income at W1	-0.0156	0.0001
	(0.0367)	(0.0291)
Log household income at W2	0.0310	0.0169
	(0.0393)	(0.0327)
Log household income at W3	0.0608	0.0360
	(0.0453)	(0.0391)
Work satisfaction: "very satisfied" at W1	-0.0069	-0.0028
	(0.0198)	(0.0196)
Work satisfaction: "very satisfied" at W2	0.0045	0.0076
	(0.0206)	(0.0205)
Work satisfaction: "very satisfied" at W3	0.0207	0.0159
	(0.0247)	(0.0247)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Treatment-contol differences with covarariates are estimated from a linear probability model that controls for program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance. (3) Sample weights used to estimate treatment-control differences are predicted probabilities of non-response in specified wave from first-stage regression using all covariates.

Table 7: Entrepreneurship Training Impact Estimates - Bounds Analysis

	Lower Bounds				Upper Bounds			Standard Deviation	
	-0.25 std.	-0.10 std.	-0.05 std.	Unadj.	+0.05 std.	+0.10 std.	+0.25 std.	Treatment	Control
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Business owner at W1 survey	0.0084	0.0346	0.0433	0.0517	0.0607	0.0694	0.0955	0.4911	0.4799
date	(0.0129)	(0.0128)	(0.0128)	(0.0153)	(0.0128)	(0.0128)	(0.0129)		
Business owner at W2 survey	-0.0461	-0.0051	0.0085	0.0208	0.0358	0.0495	0.0904	0.4953	0.4918
date	(0.0128)	(0.0127)	(0.0127)	(0.0172)	(0.0127)	(0.0127)	(0.0128)		
Business owner at W3 survey	-0.0937	-0.0331	-0.0129	0.0025	0.0275	0.0477	0.1083	0.4877	0.4854
date	(0.0117)	(0.0116)	(0.0116)	(0.0194)	(0.0116)	(0.0116)	(0.0117)		
Employed at W1 survey date	-0.0088	0.0137	0.0213	0.0271	0.0363	0.0438	0.0664	0.4105	0.4270
	(0.0116)	(0.0115)	(0.0115)	(0.0139)	(0.0115)	(0.0115)	(0.0116)		
Employed at W2 survey date	-0.0297	0.0011	0.0114	0.0194	0.0320	0.0422	0.0730	0.3621	0.3807
	(0.0097)	(0.0096)	(0.0096)	(0.0132)	(0.0096)	(0.0096)	(0.0097)		
Employed at W3 survey date	-0.1014	-0.0508	-0.0339	-0.0189	-0.0002	0.0167	0.0672	0.4121	0.4007
	(0.0097)	(0.0096)	(0.0096)	(0.0161)	(0.0096)	(0.0096)	(0.0098)		
Monthly business sales at	-1.3027	-0.7411	-0.5538	-0.3691	-0.1794	0.0078	0.5695	6.5686	9.1599
W1 survey date	(0.2216)	(0.2201)	(0.2199)	(0.2880)	(0.2199)	(0.2201)	(0.2215)		
Monthly business sales at	-1.6926	-0.7548	-0.4421	-0.1396	0.1831	0.4957	1.4336	8.8079	9.7962
W2 survey date	(0.2370)	(0.2347)	(0.2344)	(0.3528)	(0.2344)	(0.2347)	(0.2369)		
Monthly business sales at	-3.3971	-1.6728	-1.0980	-0.6204	0.0515	0.6263	2.3506	11.9129	13.8608
W3 survey date	(0.3170)	(0.3135)	(0.3131)	(0.5563)	(0.3131)	(0.3137)	(0.3173)		
Has any employees at W1	-0.0098	0.0047	0.0095	0.0140	0.0192	0.0241	0.0386	0.2793	0.2589
survey date	(0.0078)	(0.0078)	(0.0078)	(0.0095)	(0.0078)	(0.0078)	(0.0078)		
Has any employees at W2	-0.0377	-0.0131	-0.0049	0.0020	0.0115	0.0197	0.0444	0.2972	0.2918
survey date	(0.0080)	(0.0079)	(0.0079)	(0.0110)	(0.0079)	(0.0079)	(0.0080)		
Has any employees at W3	-0.0813	-0.0434	-0.0307	-0.0209	-0.0054	0.0072	0.0452	0.2907	0.3135
survey date	(0.0076)	(0.0075)	(0.0075)	(0.0128)	(0.0075)	(0.0075)	(0.0076)		
Log household income at W1	-0.1060	-0.0431	-0.0221	-0.0088	0.0199	0.0409	0.1038	0.8992	0.9111
	(0.0210)	(0.0208)	(0.0207)	(0.0251)	(0.0207)	(0.0208)	(0.0210)		
Log household income at W2	-0.1124	-0.0184	0.0129	0.0195	0.0755	0.1069	0.2008	0.9425	0.9434
	(0.0213)	(0.0211)	(0.0210)	(0.0293)	(0.0210)	(0.0211)	(0.0214)		
Log household income at W3	-0.1673	-0.0318	0.0133	0.0217	0.1037	0.1488	0.2843	0.9596	1.0113
	(0.0211)	(0.0208)	(0.0208)	(0.0353)	(0.0208)	(0.0209)	(0.0212)		
Work satisfaction: "very	-0.0427	-0.0146	-0.0053	0.0060	0.0135	0.0228	0.0509	0.4999	0.4999
satisfied" at W1	(0.0144)	(0.0144)	(0.0143)	(0.0177)	(0.0143)	(0.0144)	(0.0144)		
Work satisfaction: "very	-0.0635	-0.0206	-0.0063	0.0092	0.0223	0.0366	0.0795	0.5001	0.5001
satisfied" at W2	(0.0136)	(0.0135)	(0.0135)	(0.0188)	(0.0135)	(0.0135)	(0.0136)		
Work satisfaction: "very	-0.1223	-0.0415	-0.0145	0.0117	0.0394	0.0663	0.1472	0.5001	0.5003
satisfied" at W3	(0.0110)	(0.0109)	(0.0109)	(0.0236)	(0.0109)	(0.0109)	(0.0110)		

Notes: (1) Columns (1) and (7) impute to the lower (upper) bound the mean minus (plus) 0.25 standard deviations of the observed treatment distribution to the non-responders in the treatment group and the mean plus (minus) 0.25 standard deviations of the observed control distribution to non-responders in the control group. Columns (2, 3, 5, and 6) repeat the exercise subtracting and adding the specified standard deviations. Column 4 (unadjusted) reproduces the estimates reported in Table 4.

Table 8A: Treatment Effect Heterogeneity by Baseline Characteristics

		Discrimination		Credit Constraints	U.I. Frictions	Human Capital Constraints		
	Main Treatment	Minority * Treatment	Female * Treatment	Bad Credit * Treatment	Unemployed * Treatment	No College * Treatment	No Managerial Exp. * Treat.	Did Not Work in Fam. Bus. * Treat.
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(8)	(9)	(10)
Business owner at W1	0.0678	-0.0095	-0.0703	0.0046	0.0648	-0.0235	-0.0258	0.0074
survey date	(0.0413)	(0.0310)	(0.0307)	(0.0330)	(0.0304)	(0.0329)	(0.0323)	(0.0338)
Business owner at W2	0.0374	-0.0442	-0.0670	-0.0035	0.0218	-0.0044	0.0348	0.0188
survey date	(0.0465)	(0.0350)	(0.0348)	(0.0374)	(0.0347)	(0.0370)	(0.0367)	(0.0380)
Business owner at W3	0.0579	-0.0359	-0.0067	-0.0563	-0.0293	-0.0484	0.0841	-0.0076
survey date	(0.0518)	(0.0388)	(0.0396)	(0.0426)	(0.0393)	(0.0410)	(0.0416)	(0.0432)
Employed (bus own or	0.0753	0.0104	-0.0426	-0.0038	0.0189	-0.0422	-0.0230	-0.0129
wage/salary) at W1 survey	(0.0343)	(0.0280)	(0.0277)	(0.0300)	(0.0272)	(0.0282)	(0.0297)	(0.0298)
Employed (bus own or	0.0736	-0.0083	-0.0237	-0.0114	-0.0083	-0.0151	-0.0118	-0.0234
wage/salary) at W2 survey	(0.0315)	(0.0271)	(0.0264)	(0.0287)	(0.0257)	(0.0264)	(0.0291)	(0.0278)
Employed (bus own or	0.0194	-0.0012	-0.0294	-0.0066	-0.0303	-0.0083	-0.0217	0.0154
wage/salary) at W3 survey	(0.0397)	(0.0333)	(0.0326)	(0.0361)	(0.0320)	(0.0328)	(0.0352)	(0.0347)
Monthly business sales at	-1.1032	0.3089	0.6251	-0.1079	0.9747	0.1434	0.1755	-0.5259
W1 survey date (000s)	(1.2950)	(0.5576)	(0.5883)	(0.5433)	(0.6650)	(0.6469)	(0.6321)	(0.7345)
Monthly business sales at	-0.8260	0.2079	-0.6128	1.3104	0.4165	-0.6206	0.3505	0.5270
W2 survey date (000s)	(1.3853)	(0.6170)	(0.7721)	(0.9378)	(0.7799)	(0.9258)	(0.7530)	(0.8453)
Monthly business sales at	-2.8896	1.4896	0.5986	0.1520	2.0182	0.1962	0.2942	-0.1102
W3 survey date (000s)	(1.9324)	(1.1132)	(1.1174)	(1.2492)	(1.1977)	(1.2440)	(1.1958)	(1.2992)
Has any employees at W1	-0.0080	0.0009	-0.0143	0.0150	-0.0126	-0.0074	0.0131	0.0455
survey date	(0.0270)	(0.0179)	(0.0189)	(0.0199)	(0.0195)	(0.0205)	(0.0196)	(0.0214)
Has any employees at W2	-0.0030	-0.0053	-0.0126	-0.0104	0.0133	0.0052	0.0226	0.0023
survey date	(0.0323)	(0.0225)	(0.0225)	(0.0247)	(0.0229)	(0.0241)	(0.0228)	(0.0252)
Has any employees at W3	-0.0653	-0.0068	0.0196	-0.0313	0.0245	0.0291	0.0282	0.0154
survey date	(0.0374)	(0.0257)	(0.0263)	(0.0288)	(0.0268)	(0.0272)	(0.0272)	(0.0297)
Log household income at	-0.0197	0.0748	0.0616	0.0212	0.0055	0.0302	-0.1052	-0.0567
W1	(0.0674)	(0.0525)	(0.0510)	(0.0551)	(0.0516)	(0.0515)	(0.0544)	(0.0536)
Log household income at	-0.0025	-0.0659	0.0439	0.0735	0.0160	-0.0015	-0.0031	-0.0365
W2	(0.0776)	(0.0625)	(0.0594)	(0.0671)	(0.0593)	(0.0621)	(0.0646)	(0.0651)
Log household income at	-0.0314	0.0670	-0.0004	-0.0642	0.0549	-0.0013	0.0869	0.0083
W3	(0.1004)	(0.0752)	(0.0714)	(0.0799)	(0.0715)	(0.0733)	(0.0742)	(0.0795)
Work satisfaction: "very	0.0500	-0.0430	0.0162	0.0141	0.0069	-0.0315	0.0013	-0.0354
satisfied" at W1	(0.0488)	(0.0358)	(0.0360)	(0.0383)	(0.0361)	(0.0377)	(0.0379)	(0.0388)
Work satisfaction: "very	-0.0102	-0.0515	0.0204	0.0310	0.0183	0.0340	0.0451	-0.0508
satisfied" at W2	(0.0516)	(0.0387)	(0.0384)	(0.0411)	(0.0386)	(0.0402)	(0.0409)	(0.0414)
Work satisfaction: "very	0.0410	-0.0177	0.0050	0.0518	0.0016	-0.0095	-0.0471	-0.0340
satisfied" at W3	(0.0626)	(0.0483)	(0.0479)	(0.0528)	(0.0481)	(0.0492)	(0.0516)	(0.0517)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Covariates include program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance. (3) Each row represents a separate regression. Sample sizes are reported in Table 4.

Table 8B: Separate Treatment Effect Regressions for Subgroups

	Discrimination		Credit Constraints	U.I. Frictions	Human Capital Constraints		
	Minority	Female	Bad Credit	Unemployed	No College	No Manager. Exp.	Did Not Work in Fam. Bus.
Dependent Variable	(1)	(2)	(3)	(4)	(7)	(8)	(9)
Business owner at W1	0.0296	0.0106	0.0461	0.0839	0.0481	0.0250	0.0513
survey date	(0.0227)	(0.0217)	(0.0226)	(0.0214)	(0.0192)	(0.0244)	(0.0182)
Business owner at W2	-0.0089	-0.0148	0.0084	0.0387	0.0231	0.0386	0.0267
survey date	(0.0261)	(0.0243)	(0.0261)	(0.0239)	(0.0219)	(0.0278)	(0.0206)
Business owner at W3	-0.0263	-0.0036	-0.0393	-0.0022	-0.0221	0.0400	0.0032
survey date	(0.0314)	(0.0281)	(0.0308)	(0.0266)	(0.0256)	(0.0323)	(0.0232)
Employed (bus own or	0.0280	0.0092	0.0181	0.0278	0.0148	-0.0005	0.0196
wage/salary) at W1 survey	(0.0225)	(0.0207)	(0.0232)	(0.0212)	(0.0191)	(0.0240)	(0.0171)
Employed (bus own or	0.0161	0.0123	0.0038	0.0108	0.0139	0.0051	0.0106
wage/salary) at W2 survey	(0.0222)	(0.0200)	(0.0226)	(0.0199)	(0.0184)	(0.0238)	(0.0163)
Employed (bus own or	-0.0169	-0.0321	-0.0220	-0.0356	-0.0282	-0.0389	-0.0181
wage/salary) at W3 survey	(0.0279)	(0.0233)	(0.0288)	(0.0235)	(0.0233)	(0.0290)	(0.0196)
Monthly business sales at	-0.2022	-0.1254	-0.3277	0.0277	-0.2685	-0.1789	-0.5230
W1 survey date (000s)	(0.3137)	(0.2811)	(0.2938)	(0.3022)	(0.3409)	(0.3319)	(0.2985)
Monthly business sales at	0.0825	-0.4096	0.6022	0.0460	-0.1968	0.1230	0.0257
W2 survey date (000s)	(0.3192)	(0.3178)	(0.5387)	(0.3756)	(0.3872)	(0.4516)	(0.4282)
Monthly business sales at	0.1932	-0.5205	-0.3933	0.1172	-0.5704	-0.4267	-0.6801
W3 survey date (000s)	(0.7202)	(0.4374)	(0.6813)	(0.6404)	(0.7900)	(0.6028)	(0.6488)
Has any employees at W1	0.0217	0.0105	0.0213	0.0084	0.0155	0.0291	0.0273
survey date	(0.0136)	(0.0130)	(0.0136)	(0.0114)	(0.0124)	(0.0143)	(0.0111)
Has any employees at W2	-0.0038	-0.0047	-0.0050	0.0090	0.0058	0.0156	0.0009
survey date	(0.0170)	(0.0149)	(0.0162)	(0.0136)	(0.0143)	(0.0165)	(0.0126)
Has any employees at W3	-0.0241	-0.0145	-0.0357	-0.0092	-0.0096	0.0048	-0.0162
survey date	(0.0211)	(0.0182)	(0.0203)	(0.0161)	(0.0175)	(0.0212)	(0.0148)
Log household income at W1	0.0404	0.0163	0.0238	-0.0180	0.0046	-0.0686	-0.0299
	(0.0432)	(0.0383)	(0.0400)	(0.0351)	(0.0345)	(0.0443)	(0.0308)
Log household income at W2	-0.0070	0.0392	0.0579	0.0232	0.0335	0.0086	0.0063
	(0.0492)	(0.0425)	(0.0500)	(0.0409)	(0.0392)	(0.0524)	(0.0349)
Log household income at W3	0.0344	0.0224	0.0078	0.0380	0.0307	0.0799	0.0285
	(0.0646)	(0.0518)	(0.0608)	(0.0480)	(0.0485)	(0.0585)	(0.0408)
Work satisfaction: "very	-0.0143	0.0145	0.0024	0.0102	-0.0036	0.0000	-0.0076
satisfied" at W1	(0.0276)	(0.0260)	(0.0272)	(0.0239)	(0.0229)	(0.0296)	(0.0214)
Work satisfaction: "very	-0.0178	0.0228	0.0246	0.0150	0.0343	0.0409	-0.0058
satisfied" at W2	(0.0301)	(0.0273)	(0.0296)	(0.0257)	(0.0247)	(0.0322)	(0.0228)
Work satisfaction: "very	0.0222	0.0146	0.0440	0.0073	0.0127	-0.0183	0.0017
satisfied" at W3	(0.0405)	(0.0346)	(0.0402)	(0.0330)	(0.0330)	(0.0417)	(0.0285)
W1 sample size	1,448	1,636	1,491	1,870	2,100	1,268	2,355
W2 sample size	1,217	1,454	1,265	1,639	1,804	1,097	2,077
W3 sample size	915	1,167	958	1,335	1,382	844	1,686

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Covariates include program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance. (3) Each row/column represents a separate regression.

Appendix Table 1: Regressions for Probability of Receiving Entrepreneurship Training

	W1	W2	W3
	(1)	(2)	(3)
Female	0.0242	0.0410	0.0413
	(0.0259)	(0.0276)	(0.0295)
Black	0.0843	0.0694	0.1123
	(0.0365)	(0.0403)	(0.0446)
Latino	0.0688	0.0878	0.1027
	(0.0628)	(0.0643)	(0.0642)
Asian	-0.1439	-0.0679	-0.0730
	(0.0846)	(0.0988)	(0.1129)
Other	0.0072	0.0260	0.1006
	(0.0487)	(0.0536)	(0.0550)
Not U.S. born	0.0706	0.0498	0.0719
	(0.0523)	(0.0564)	(0.0582)
Age	0.0100	0.0056	0.0017
	(0.0098)	(0.0105)	(0.0113)
Age squared	-0.0001	0.0000	0.0000
	(0.0001)	(0.0001)	(0.0001)
Married	0.0202	0.0308	0.0485
	(0.0306)	(0.0334)	(0.0365)
Has children	0.0267	0.0154	0.0327
	(0.0286)	(0.0311)	(0.0331)
Highest grade completed	0.0213	0.0393	0.0446
	(0.0112)	(0.0123)	(0.0135)
College education	0.0136	-0.0304	-0.0652
	(0.0498)	(0.0540)	(0.0570)
HH Income $25,000-49,999	0.0232	0.0250	0.0709
	(0.0326)	(0.0359)	(0.0390)
HH Income $50,000-74,999	0.0185	0.0199	0.0705
	(0.0414)	(0.0456)	(0.0498)
HH Income $75,000-99,999	0.0808	0.1354	0.2253
	(0.0577)	(0.0594)	(0.0599)
HH Income $100,000+	0.0917	0.0795	0.0980
	(0.0565)	(0.0603)	(0.0651)
Wage/salary work	-0.0133	-0.0089	-0.0311
	(0.0380)	(0.0425)	(0.0453)
Self-employed with no employees	0.0795	0.0867	0.0274
	(0.0460)	(0.0457)	(0.0493)
Self-employed with employees	0.0118	0.0315	0.0014
	(0.0455)	(0.0472)	(0.0503)
Has a health problem	0.0037	-0.0063	-0.0032
	(0.0470)	(0.0520)	(0.0586)
Has relatives or friends who have been previously S.E.	0.0406	0.0216	0.0270
	(0.0319)	(0.0341)	(0.0370)
Ever worked for relatives or friends who are S.E.	0.0078	0.0248	0.0410
	(0.0306)	(0.0329)	(0.0348)
Has a bad credit history	-0.0395	0.0277	0.0369
	(0.0293)	(0.0318)	(0.0346)
Currently receiving UI benefits	-0.0386	-0.0297	-0.0610
	(0.0292)	(0.0312)	(0.0330)
Has health insurance from current employer	-0.0586	-0.0900	-0.0707
	(0.0385)	(0.0426)	(0.0462)
Autonomy index	0.0066	-0.0156	-0.0078
	(0.0119)	(0.0131)	(0.0139)
Risk tolerance index	0.0174	0.0176	0.0404
	(0.0127)	(0.0140)	(0.0150)
Magerial experience	0.0142	0.0455	0.0554
	(0.0279)	(0.0299)	(0.0327)
Treatment	0.1198	0.2980	0.4986
	(0.3111)	(0.3319)	(0.3616)

(Continued)

Appendix Table 1: Continued

	(1)	(2)	(3)
Female*treatment	-0.0216	-0.0557	-0.0635
	(0.0327)	(0.0333)	(0.0352)
Black*treatment	-0.0726	-0.0443	-0.0424
	(0.0475)	(0.0500)	(0.0546)
Latino*treatment	-0.0673	-0.0716	-0.0872
	(0.0765)	(0.0754)	(0.0770)
Asian*treatment	0.1176	0.0108	0.0860
	(0.1081)	(0.1202)	(0.1342)
Other*treatment	0.0194	0.0126	-0.0407
	(0.0612)	(0.0631)	(0.0629)
Not U.S. born*treatment	-0.1275	-0.0941	-0.1264
	(0.0683)	(0.0703)	(0.0763)
Age*treatment	0.0090	0.0069	0.0040
	(0.0120)	(0.0125)	(0.0134)
Age squared*treatment	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0002)
Married*treatment	0.0040	-0.0086	-0.0441
	(0.0385)	(0.0401)	(0.0429)
Has children*treatment	-0.0196	0.0039	0.0161
	(0.0358)	(0.0369)	(0.0390)
Highest grade completed*treatment	0.0109	0.0003	-0.0124
	(0.0144)	(0.0150)	(0.0163)
College education*treatment	-0.0352	-0.0327	0.0356
	(0.0624)	(0.0642)	(0.0678)
HH Income $25,000-49,999*treatment	-0.0554	-0.0262	-0.0829
	(0.0424)	(0.0443)	(0.0472)
HH Income $50,000-74,999*treatment	-0.0216	-0.0321	-0.0875
	(0.0518)	(0.0547)	(0.0581)
HH Income $75,000-99,999*treatment	-0.0813	-0.1646	-0.2571
	(0.0708)	(0.0720)	(0.0722)
HH Income $100,000+*treatment	-0.0573	-0.0680	-0.0968
	(0.0677)	(0.0708)	(0.0751)
Wage/salary work*treatment	-0.0189	-0.0173	0.0127
	(0.0482)	(0.0508)	(0.0537)
Self-employed with no employees*treatment	-0.0613	-0.0610	-0.0432
	(0.0557)	(0.0539)	(0.0584)
Self-employed with employees*treatment	0.0488	0.0310	0.0283
	(0.0545)	(0.0533)	(0.0569)
Has a health problem*treatment	0.0285	0.0052	0.0059
	(0.0585)	(0.0617)	(0.0682)
Has relatives or friends who have been previously S.E.*treatment	-0.0264	-0.0083	-0.0123
	(0.0404)	(0.0414)	(0.0447)
Ever worked for relatives or friends who are S.E.*treatment	-0.0099	-0.0086	-0.0060
	(0.0377)	(0.0386)	(0.0402)
Has a bad credit history*treatment	0.0457	0.0010	-0.0225
	(0.0367)	(0.0377)	(0.0404)
Currently receiving UI benefits*treatment	0.0552	0.0533	0.0827
	(0.0373)	(0.0380)	(0.0399)
Has health insurance from current employer*treatment	0.1029	0.1439	0.1085
	(0.0484)	(0.0503)	(0.0537)
Autonomy index*treatment	-0.0046	0.0166	0.0137
	(0.0155)	(0.0163)	(0.0175)
Risk tolerance index*treatment	-0.0091	-0.0094	-0.0325
	(0.0164)	(0.0169)	(0.0180)
Magerial experience*treatment	0.0302	-0.0100	-0.0212
	(0.0351)	(0.0362)	(0.0392)

Notes: (1) All reported characteristics are measured at time of application, prior to random assignment. (2) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application.

Appendix Table 2: Self-Reported Amount that Entrepreneurship Training Helped Recipients in Various Ways

	Very Useful	Somewhat Useful	Not Very Useful	Not at All Useful
How would you rate the overall usefulness of the services you have received?				
Treatment group	51.7%	33.7%	8.5%	6.1%
Control group	35.8%	40.8%	10.8%	12.7%

	Treatment Group			Control Group		
GATE Services	A Lot	Somewhat	Not at All	A Lot	Somewhat	Not at All
Helped with applying for loans	12.6%	21.5%	65.9%	5.9%	17.2%	76.8%
Helped with deciding whether to pursue self. em	39.5%	33.1%	27.4%	23.6%	30.0%	46.4%
Helped with refining the business idea	34.1%	37.2%	28.8%	23.0%	32.3%	44.7%
Helped with credit issues	16.4%	25.8%	57.7%	10.9%	17.3%	71.7%
Helped with developing a marketing strategy	31.4%	37.4%	31.2%	19.6%	31.6%	48.8%
Helped with legal issues	19.3%	35.5%	45.2%	11.3%	28.2%	60.6%
Helped with accounting issues	23.7%	35.9%	40.4%	12.1%	26.9%	61.0%
Helped with hiring and dealing with employees	12.7%	24.7%	62.6%	7.3%	18.1%	74.5%
Helped with networking	28.7%	37.9%	33.4%	23.1%	31.2%	45.7%
Helped with using computers and technology	13.3%	26.5%	60.2%	12.1%	22.2%	65.7%
Helped with dealing with clients	16.7%	35.1%	48.2%	11.3%	30.4%	58.3%
Helped with providing psychological support	16.6%	31.0%	52.4%	13.1%	23.8%	63.1%

Notes: (1) Sample includes treatment and control group participants who received any entrepreneurship training by wave 1 follow-up survey (6 months). (2) Evaluation of services was asked at W1.

Appendix Table 3: Business Ownership, Entry and Exit

	Treatment	N	Control	N	Treatment-Control	
					No Covars	Covariates
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Business owner at W1 survey date	0.4056	1753	0.3592	1690	0.0464	0.0517
					(0.0165)	(0.0153)
Business owner at W2 survey date	0.4307	1558	0.4091	1474	0.0216	0.0208
					(0.0179)	(0.0172)
Business owner at W3 survey date	0.3889	1273	0.3794	1173	0.0095	0.0025
					(0.0197)	(0.0194)
Started business by W1 (no business at application date)	0.3203	1383	0.2578	1307	0.0625	0.0619
					(0.0174)	(0.0173)
Started business by W2 (no business at application date)	0.3593	1219	0.3292	1130	0.0301	0.0245
					(0.0196)	(0.0195)
Started business by W3 (no business at application date)	0.3202	990	0.3125	896	0.0077	-0.0023
					(0.0215)	(0.0219)
Exited business by W1 (had business at application date)	0.2202	327	0.2351	336	-0.0149	-0.0277
					(0.0326)	(0.0330)
Exited business by W2 (had business at application date)	0.2667	300	0.2787	305	-0.0120	-0.0120
					(0.0363)	(0.0368)
Exited business by W3 (had business at application date)	0.3320	253	0.3633	245	-0.0312	-0.0231
					(0.0428)	(0.0439)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Treatment-contol differences with covarariates are estimated from a linear probability model that controls for program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance.

Appendix Table 4: Impact of Entrepreneurship Training on Additional Business Outcomes

	Treatment	N	Control	N	Treatment-Control	
					No Covars	Covariates
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Number of employees at W1	0.4245	1748	0.3479	1690	0.0766	0.0365
					(0.1076)	(0.1035)
Number of employees at W2	0.4093	1554	0.3751	1469	0.0342	-0.0347
					(0.0914)	(0.0785)
Number of employees at W3	0.4002	1267	0.6510	1169	-0.2508	-0.3413
					(0.1651)	(0.1791)
Monthly profits (sales minus reported expenses) at W1	0.2927	1590	0.7609	1556	-0.4682	-0.4618
					(0.1664)	(0.1697)
Monthly profits (sales minus reported expenses) at W2	0.6845	1422	0.7154	1314	-0.0310	0.0450
					(0.2046)	(0.1863)
Monthly profits (sales minus reported expenses) at W3	0.7121	1191	1.0038	1090	-0.2917	-0.3745
					(0.3259)	(0.3419)
Business outcome index W1	-0.0437	1590	-0.0210	1556	-0.0227	-0.0203
					(0.0237)	(0.0240)
Business outcome index W2	-0.0244	1422	-0.0283	1314	0.0040	0.0056
					(0.0275)	(0.0272)
Business outcome index W3	-0.0589	1190	-0.0101	1088	-0.0488	-0.0575
					(0.0278)	(0.0293)
Business income(percentage of household income) W1	13.7085	1172	18.0898	1157	-4.3813	-6.3821
					(4.0828)	(4.2912)
Business income(percentage of household income) W2	20.3063	991	23.4309	960	-3.1246	-2.2044
					(5.3408)	(5.5336)
Business income(percentage of household income) W3	7.6997	816	15.1743	787	-7.4746	-8.7972
					(4.2353)	(4.4464)
Business income (salary plus profit distributions) W1	6.4387	1477	4.4939	1449	1.9448	2.0747
					(2.0164)	(2.1999)
Business income (salary plus profit distributions) W2	5.9756	1259	5.0668	1198	0.9089	1.4236
					(2.1166)	(2.3258)
Business income (salary plus profit distributions) W3	3.8707	1070	4.3490	1024	-0.4782	-0.4042
					(2.0288)	(2.2249)

Notes: (1) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (2) Treatment-contol differences with covarariates are estimated from a linear probability model that controls for program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance. (3) The business outcome index is an equally weighted average of z-scores from sales, any employees, number of employees, and profits. Z-scores are calculated by subtracting the control group mean and dividing by the control group standard deviation.

Appendix Table 5: LATE Estimates and Non-Experimental Correlations between Entrepreneurship Training and Outcomes for Control Group

	Received Training - No Training					
	LATE (IV)			Non-Experimental		
	No Covars	Covariates	N	No Covars	Covariates	N
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Business owner at W1 survey date	0.1262	0.1345	6880	0.1965	0.1533	1685
	(0.0441)	(0.0391)		(0.0234)	(0.0225)	
Business owner at W2 survey date	0.0805	0.0697	6034	0.2579	0.2212	1462
	(0.0612)	(0.0567)		(0.0247)	(0.0251)	
Business owner at W3 survey date	0.0415	0.0066	4867	0.2277	0.2098	1162
	(0.0844)	(0.0812)		(0.0277)	(0.0297)	
Employed (bus own or wage/salary)	0.0681	0.0695	6882	0.0305	0.0035	1685
at W1 survey date	(0.0384)	(0.0361)		(0.0208)	(0.0208)	
Employed (bus own or wage/salary)	0.0739	0.0684	6039	0.0484	0.0445	1462
at W2 survey date	(0.0464)	(0.0436)		(0.0204)	(0.0203)	
Employed (bus own or wage/salary)	-0.0780	-0.0833	4865	0.0472	0.0410	1160
at W3 survey date	(0.0713)	(0.0679)		(0.0253)	(0.0267)	
Monthly business sales at W1 survey	-1,092	-954	6415	836	561	1575
date	(752)	(747)		(476)	(463)	
Monthly business sales at W2 survey	-236	-453	5560	1,248	1,285	1337
date	(1108)	(1135)		(478)	(533)	
Monthly business sales at W3 survey	-2,087	-2,604	4622	2,058	2,035	1101
date	(2303)	(2344)		(751)	(867)	
Has any employees at W1 survey	0.0364	0.0373	6870	0.0354	0.0304	1685
date	(0.0248)	(0.0244)		(0.0130)	(0.0132)	
Has any employees at W2 survey	0.0146	0.0067	6016	0.0505	0.0442	1457
date	(0.0371)	(0.0366)		(0.0149)	(0.0158)	
Has any employees at W3 survey	-0.0771	-0.0921	4847	0.0678	0.0641	1158
date	(0.0535)	(0.0544)		(0.0176)	(0.0186)	
Log household income at W1	-0.0611	-0.0208	6441	0.1062	0.0012	1571
	(0.0851)	(0.0639)		(0.0466)	(0.0388)	
Log household income at W2	0.1229	0.0616	5566	0.0396	-0.0447	1348
	(0.1212)	(0.0965)		(0.0522)	(0.0442)	
Log household income at W3	0.2486	0.0869	4516	0.0833	-0.0285	1082
	(0.1805)	(0.1478)		(0.0653)	(0.0639)	
Work satisfaction: "very satisfied" at	-0.0024	0.0133	6812	-0.0102	-0.0126	1672
W1	(0.0456)	(0.0450)		(0.0246)	(0.0263)	
Work satisfaction: "very satisfied" at	0.0178	0.0272	5956	0.0225	0.0063	1441
W2	(0.0627)	(0.0624)		(0.0266)	(0.0286)	
Work satisfaction: "very satisfied" at	0.0367	0.0444	3827	0.0683	0.0812	923
W3	(0.1003)	(0.1026)		(0.0349)	(0.0378)	

Notes: (1) The first-stage in the LATE model regresses receipt of entrepreneurship training on treatment. The second-stage regresses the listed outcome on predicted receipt of entrepreneurship training. (2) In the non-experimental regressions, the listed outcome is regressed on receipt of entrepreneurship training. The sample includes only observations for the control group. (4) The wave 1, wave 2 and wave 3 surveys are conducted at 6, 18, and 60 months after time of application. (5) Covariates include program sites, female, race, immigrant, age, married, children, education level, household income, self-employed at application, health problems, worked in family business, bad credit history, unemployment compensation, employer provided health insurance, autonomy, and risk tolerance.