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From unemployment to self-employment: The role of entrepreneurship training

Abstract

We present experimental evidence on the effects of entrepreneurship training for unemployed workers in the U.S. at two different stages in the business cycle. In the context of a strong economy, training helped training participants – particularly those with prior self-employment experience – to start a business and become self-employed, while it may have persuaded others to pursue salary employment instead. During the Great Recession, training helped training participants become self-employed, particularly those with no prior self-employment experience. Regardless of economic conditions, positive impacts on self-employment were partly or largely offset by reductions in regular employment. These findings indicate that entrepreneurship training may help unemployed workers to become self-employed at different stages of the business cycle, but there is weak evidence that it can be an effective policy for combating unemployment, particularly during recessions.

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List of Abbreviations

DOL	U.S. Department of Labor
GATE	Growing America Through Entrepreneurship
ITT	intent-to-treat
LATE	Local average treatment effect
SEA	Self-Employment Assistance
UI	Unemployment Insurance

1 Introduction

Many unemployed workers in the United States and other developed countries view self-employment as an attractive reemployment option, especially those who face the prospect of long-term unemployment (Dennis, 1996; Bates, 1997; Thurik et al., 2008; von Greiff, 2009). Lack of labor market options notwithstanding, the unemployed face lower opportunity costs and are more willing than employed workers to invest the time and undertake the risk to start a business (Meager, 1992; Bates and Servon, 2000; Grilo and Thurik, 2005; Glocker and Steiner, 2007). Over the past three decades, U.S. policymakers have been concerned that although many skilled unemployed workers aspire to become business owners, they may lack the business background and financing access needed to succeed. For this reason, they have supported entrepreneurship training programs to help unemployed workers overcome these obstacles and start their own businesses, thereby reducing the amount of time they remain unemployed (Wandner, 2010, pp. 289-340).

This article examines whether government-sponsored entrepreneurship training can help unemployed workers interested in self-employment to improve their labor market outcomes and serve as an effective policy for combating unemployment at different stages of the business cycle.[1] We consider five demonstration programs funded by the U.S. Department of Labor (DOL): three programs that operated from September 2003 to July 2005 (a period of moderate unemployment) in Maine, Minnesota, and Pennsylvania and two programs that operated from January 2009 to December 2010 (during the Great Recession) in North Carolina and Virginia. The programs offered participants training workshops to educate them on the different aspects of starting and operating a business as well as business counseling to help them develop and execute viable business plans.

Mostly because of DOL's involvement, the five programs had a very similar design. Each program randomly selected which applicants would be offered training and which applicants would be excluded from the program. The programs followed similar applicant recruitment and random assignment procedures, offered the same types of services to participants, and collected similar information on participants' labor market outcomes following program entry. These common features enable us to examine the causal effects of each program on participant outcomes and assess whether training effects vary when implemented in different state economies and at different stages of the business cycle.

1 There is a distinction in the use of the terms "self-employment" and "entrepreneurship." Entrepreneurship is usually used to describe activities to start a business and make a profit, whereas self-employment is usually used to describe when individuals work for themselves, either as contractors/freelancers or by owning a business. We use the term "self-employment" to mean both.

This study is not the first to provide experimental evidence on the effects of entrepreneurship training programs in the U.S. context. Prior work shows that training can help unemployed workers collecting unemployment insurance (UI) benefits to start their own businesses and improve their reemployment outcomes (Benus et al., 1995). Studies that pooled data from the same Maine, Minnesota, and Pennsylvania programs considered here show that training can help nascent entrepreneurs to start a business in the context of a relatively strong economy (Michaelides and Benus, 2012; Fairlie et al., 2015; Michaelides, 2020).

Our study contributes to this literature in various ways. This study is the first to provide experimental evidence on the effects of entrepreneurship training in a weak economy. Many factors could influence the relative efficacy of entrepreneurship training during a recession. There is an expanded pool of unemployed workers during recessions who may consider entrepreneurship as an alternative to salary employment, including high-skill workers who would not have employability issues under normal circumstances (Aaronson et al., 2004; Constant and Zimmerman, 2004; Alba-Ramirez, 2006; Koellinger and Thurik, 2012; Michaelides and Mueser, 2013). Recessions also bring reduced opportunity and business start-up costs which, combined with fewer job options, may encourage more workers than usual to start a business, thereby increasing demand for training (Rissman, 2003; Rampini, 2004; Mandelman and Montes-Rojas, 2009; Biehl et al., 2014). On the other hand, training may be less valuable in a weak economy when business opportunities are limited and securing start-up financing may prove to be very challenging (Block et al, 2010; Fairlie, 2013; Kennickell et al., 2017). Analyses of the North Carolina and Virginia programs, which operated during the Great Recession, allow us to assess the efficacy of training in the context of a weak economy and compare the results with those of the three (similar) programs that operated in a relatively strong economy.

Our study also makes different methodological choices than did prior studies, including studies of the same Maine, Minnesota, and Pennsylvania programs considered here. First, we privilege local average treatment effect (LATE) estimates over intent-to-treat (ITT) effect estimates. We believe LATE estimates are more policy-relevant in this context because many applicants do not comply with the treatment protocol. In particular, using data on services received by treatment cases from the government program and substitute services received by control cases from the community, we find that many treatment cases do not receive the services offered by the government program and that many control cases receive similar services from the community after they are denied government services. Thus, our discussion focuses on LATEs, which estimate the effect of training for compliers, that is, those who would not have received training in the absence of the government program.

Second, instead of pooling data from all programs operating in the same period (a strategy used by prior work to evaluate the Maine, Minnesota, and Pennsylvania programs), we consider each program separately. Our results validate this choice, as we identify different patterns across states both in the proportion of compliers and in the effects of training on participant outcomes, highlighting heterogeneity across state contexts not identified by prior work.

Third, in addition to considering program effects on the likelihood of an individual becoming self-employed (a key outcome of interest both here and in past work), our analyses explicitly distinguish between self-employment in own business and independent self-employment. Self-employment in own business indicates that the individual started a business and was the sole (or primary) operator of the business, while independent self-employment indicates

that the individual was self-employed as a contractor/freelancer but did not own a business. There are many reasons why self-employed workers may find it in their best interest to start a business, including to improve their chances of securing credit, limit their liability for their business debts, obtain tax flexibility, hire employees, make their services and products more attractive to customers, and potentially achieve higher earnings (Kugler et al., 2017). The distinction between self-employment in own business and independent self-employment enables us to identify program mechanisms not previously considered, including that: (1) training may not increase overall self-employment but may help compliers start their own business instead of becoming self-employed as independent contractors and (2) training may increase salary employment and earnings by nudging compliers to consider salary employment instead of independent self-employment.

Our analyses begin by examining whether the programs increased receipt of entrepreneurship training. Inspired by studies that show that new (or existing) government programs may displace alternatives that are available in the community (e.g., Kline and Walters, 2016), we examine whether, in the absence of a government option, unemployed workers could avail themselves of entrepreneurship training available in the community. If community options are available, then similarly focused government programs may displace those options and or have limited value in improving training access. Using program data, which report services received by treatment cases from government programs and substitute services received by control cases from the community, we compare training receipt rates (and types of services received) between treatment and control cases.

We then present LATEs on labor market outcomes for each program, including self-employment (in own business, contractor, and overall), salary employment, monthly earnings (self-employment, salary, and total), and the number of employees hired to support self-employment activities. In addition, we undertake analyses to identify whether training effects varied based on individual traits, particularly based on characteristics that capture human capital (such as education and age), entrepreneurship skills (such as self-employment experience and experience working in a family business), and financing access (such as credit history and household income). These analyses identify whether policymakers can improve program efficacy by targeting training to individuals who are most likely to benefit from the treatment.

We organize the remainder of the article as follows. Section 1 describes the policy context and evidence on the efficacy of U.S. entrepreneurship training programs. Section 2 discusses the operational details of each program, including the application process, training offered to participants, applicants' characteristics, and the context of operation. Section 3 presents the methodology and results. Section 4 summarizes the findings and conclusions.

2 Background

2.1 Entrepreneurship training in the United States

In the early 1990s, U.S. policymakers recognized that many unemployed workers were interested in self-employment instead of finding regular jobs, but public employment offices did not offer any services to help them start their own businesses. In 1992, DOL implemented two demonstration programs—the Washington Self-Employment and Enterprise Development Project and the Massachusetts Enterprise Project—which offered entrepreneurship training

and monetary assistance to unemployed workers who were collecting UI benefits (Benus et al., 1995). The results of these demonstrations convinced Congress to authorize states to create self-employment assistance (SEA) programs for a 5-year trial period under the North America Free Trade Agreement Implementation Act of 1993. SEA programs offered participants a financial stipend to allow them to devote their time to entrepreneurship activities instead of searching for a job and training and technical assistance to support their business start-up efforts.

SEA programs were permanently authorized in 1998 but ultimately fell short of accomplishing their objectives. The programs' reach was restricted by a congressional mandate that only UI recipients at high risk of exhausting UI were eligible for SEA.[2] The policy objective was clearly to help UI recipients who were at high risk of exhausting benefits to start their own business, thereby reducing UI program costs (Kosanovich et al., 2002). These individuals accounted for less than 20% of the UI population and less than 10% of the entire unemployed population (Wandner, 2008). Also, because Congress did not appropriate new funds to support these programs, only nine states adopted SEA programs: Delaware, Louisiana, Maine, Maryland, Minnesota, New Jersey, New York, Oregon, and Pennsylvania (Wandner, 2010). Resource limitations did not allow these states to offer training to all interested participants and, in many cases, participants were referred to community programs, leading to low overall training take-up (Kosanovich et al., 2002).

Policymakers recognized these limitations and shifted their attention to programs that would have sufficient resources and be available to all workers, not only those collecting UI benefits. In 2003, DOL funded the Project "Growing America Through Entrepreneurship" (GATE) demonstration programs to test this new approach. Project GATE programs operated through public employment offices in Maine, Minnesota, and Pennsylvania, and (in contrast to the early 1990s demonstrations and the SEA programs operating at the time) accepted applications from all interested workers. The program offered participants training workshops covering topics related to the business start-up process and business counseling to help them develop and implement viable business plans (Bellotti et al., 2007). While Project GATE programs were operating, DOL issued directives to state workforce agencies to encourage the use of Workforce Investment Act (WIA) funds to support entrepreneurship training activities.[3]

Efforts to promote entrepreneurship training for unemployed workers were intensified during the Great Recession. In 2008, DOL awarded GATE II grants to workforce agencies in Alabama, North Carolina, Virginia, and Minnesota to operate programs that replicated the Project GATE design (Davis et al., 2017). In 2012, DOL awarded grants to workforce investment boards in Florida and Virginia to implement entrepreneurship training programs. DOL also encouraged the use of WIA funds for entrepreneurship training activities[4] and the Workforce Innovation and Opportunity Act of 2014 authorized states to include entrepreneurship training in the set of services offered to dislocated and disadvantaged workers.[5]

2 SEA programs were required to use statistical profiling mechanisms developed under the Worker Profiling and Reemployment Services (WPRS) program to identify eligible participants. Only UI recipients with high profiling scores (i.e., high predicted probability of exhausting UI benefits based on observed characteristics) were eligible for SEA. For a discussion of WPRS profiling mechanisms, see Dickinson *et al.* (2002).

3 U.S. Department of Labor Training and Employment Guidance Letter No. 16-04, February 2005 (https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=1684).

4 U.S. Department of Labor Training and Employment Guidance Letter No. 12-10, November 2010 (https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=2957).

5 Workforce Innovation and Opportunity Act of 2014, Public Law 113-128. (https://www.gpo.gov/fdsys/pkg/PLAW-113publ128/pdf/PLAW-113publ128.pdf).

2.2 **Evidence base**

What research has been done on entrepreneurship training in the U.S. has largely examined programs that operated in periods of moderate unemployment. A government study found that the early-1990s demonstration programs in Massachusetts and Washington helped participants to become self-employed, leading to positive short-term effects on overall employment rates (Benus et al., 1995). Effects on earnings were mixed. The Washington program increased self-employment earnings, but this effect was offset by a reduction in wage and salary earnings, while the Massachusetts program had no effects on either type of earnings.

The most recent experimental evidence derives from the Project GATE experiments (Michaelides and Benus, 2012; Fairlie et al., 2015; Michaelides, 2020). Pooling data from the three Project GATE programs, these studies showed that, at 6 months after program entry, treatment cases had higher self-employment and total employment rates than control cases. Effects mainly occurred for participants who were unemployed at program entry; there were no effects for participants who were employed in salary jobs or who were already self-employed at program entry.[6] Impacts on self-employment for unemployed participants were sustained after the initial 6-month period, but effects on total employment declined over time, indicating that unemployed control cases who were unable to become self-employed ultimately turned to wage and salary jobs. The studies found no short- or long-term effects on participants' earnings.

The current literature provides no evidence on the efficacy of entrepreneurship training during recessions and no formal theoretical models of how the effectiveness of training may vary with the business cycle. This is a conspicuous evidence gap given the policymaker's support that entrepreneurship training programs received during the Great Recession. Conceptually, demand for training may be higher during recessions, when business start-up costs and individual opportunity costs tend to be low, and thus more unemployed workers than usual may decide to pursue self-employment (Rissman, 2003; Rampini, 2004; Alba-Ramirez, 2006; Mandelman and Montes-Rojas, 2009; Biehl et al., 2014). Also, the socioeconomic profile of the unemployed population is affected by prevailing economic conditions, with relatively more educated and experienced workers becoming unemployed during recessions than during good economic times (Koellinger and Thurik, 2012; Michaelides and Mueser, 2013). It is thus likely that, during recessions, there would be relatively more skilled unemployed workers who might be willing to pursue self-employment and, with the right assistance, succeed. On the other hand, during recessions, start-up financing is scarce for many reasons, including that credit institutions are reluctant to invest in start-ups or because declining home values limit the ability of aspiring entrepreneurs to use home equity to finance their business (Block et al, 2010; Fairlie, 2013; Kennickell et al, 2014). Thus, entrepreneurship training may be less valuable in a weak economy because participants would not be able to secure start-up financing even if training helps them develop a viable business plan and provides them information on various financing options.

Our article provides empirical evidence to fill this literature gap. We investigate and compare the effects of government-sponsored entrepreneurship training during a period of moderate unemployment and a severe recession and assess whether entrepreneurship training is a viable policy option to combat unemployment at different stages of the business cycle.

6 These results confirmed findings of an earlier government study (Benus *et al*., 2010). This earlier study convinced policymakers that entrepreneurship training should focus only on unemployed workers, which led to the decision that GATE II programs would target only the unemployed.

3 Program description

3.1 Design and implementation

DOL implemented Project GATE in Maine, Minnesota, and Pennsylvania because these states had SEA-enabling legislation that allowed them to legally support entrepreneurship training activities. The Pennsylvania program operated in Philadelphia and Pittsburgh, the Minnesota program operated in Minneapolis/St. Paul and Duluth, and the Maine program operated in Portland, Lewiston, and Bangor. Program recruitment in each state followed a straightforward sequence. Interested individuals who were at least 18 years old could register at designated public employment offices, by calling a toll-free number or through the program's website. To boost registration, the programs implemented a marketing campaign that included brochures and posters at program sites, fliers, media events, public service announcements, and networking with local government agencies and community-based organizations (Benus et al., 2010). Registered individuals were invited to an orientation meeting to obtain information about program services. Those wishing to participate were required to complete an application form and sign an informed consent statement that program participation was not guaranteed and that participants would be randomly selected from the pool of all applicants. Program registrations started in September 2003 and were done on a rolling basis through July 2005.

Individuals who completed the application form and signed the informed consent statement (hereafter, *applicants*) were randomly assigned to the treatment or the control group. Treatment individuals were offered two types of services: training workshops and individual business counseling. Workshops were designed to familiarize participants with different aspects of starting and running a business, such as how to develop a business plan, apply for start-up capital, develop and maintain customer relationships, manage finances, and hire staff. In the individual business counseling sessions, participants had an opportunity to discuss and determine the feasibility of their business idea with an experienced business counselor. Counselors assisted participants who had promising business ideas to develop viable business plans or make modifications to their existing plans. Counselors also provided information on available credit options, technical support to determine eligibility for Federal start-up financing programs, and credit application assistance. On the other hand, counselors encouraged participants with less promising ideas to consider alternative options that appeared to be more feasible based on their interests and background, including to pursue salary employment instead.[7] Control individuals were informed that they were not selected for the program and were denied access to program services but could, on their own initiative access similar services available in the community.[8]

To ensure that training met high-quality standards, DOL used a competitive process to select training providers with experience in providing small-business counseling. Through

7 As noted in the implementation report of the Project GATE programs (Benus *et al.*, 2010, p. 39): "While [counselors] were instructed not to deny services to participants based on their business ideas or suitability for self-employment, most [counselors] did give participants frank assessments of their ability to pursue entrepreneurship and in some cases discouraged participants whom they believed would not succeed."

8 To minimize the likelihood that control individuals would reapply for the program and get assigned to the treatment group under the new application, program staff checked the information on new applications (e.g., name, address, and social security number) against old applications and disqualified those who had applied for the program in the past.

this process, Small Business Development Centers (SBDCs),[9] community colleges, and other community-based organizations were selected to support the training delivery process, in coordination with program staff at public employment offices. For a detailed discussion of the programs' implementation, see Bellotti et al. (2007).

In 2008, DOL awarded GATE II grants to the Alabama, North Carolina, Virginia, and Minnesota workforce agencies. The only distinction with Project GATE was that GATE II programs accepted applications only from unemployed workers, while Project GATE programs accepted applications from all individuals, regardless of employment status. GATE II operated statewide in North Carolina, Alabama, and Minnesota, while the Virginia program operated in Northern Virginia and Richmond. There were notable implementation differences across GATE II programs. Alabama and North Carolina accepted applications from all unemployed workers (18+ years old); Virginia and Minnesota accepted applications only from older unemployed workers (45+ years old). North Carolina and Virginia used random assignment to determine participation and conducted follow-up surveys to collect outcomes information; Alabama and Minnesota offered training to all applicants and did not collect follow-up outcomes. Thus, our GATE II analyses consider only the North Carolina and Virginia programs.

North Carolina and Virginia replicated Project GATE's recruitment and service delivery process. Similar to Project GATE, GATE II programs used a mass media marketing campaign to boost enrollment and accepted registrations on a rolling basis from January 2009 through December 2010. Individuals who registered for GATE II were invited to an orientation to receive program information. Those who remained interested in the program were required to complete the application form and sign the informed consent statement. Applicants were then randomly assigned to treatment and control groups. Treatment individuals were offered program services, while those in the control were informed that they were not selected for the program and had no access to program services[10] but could, on their own initiative, access community options. To support service delivery, each program selected SBDCs and community colleges with experience in providing entrepreneurship training and technical support.[11] For a description of GATE II's implementation, see Davis et al. (2017).

3.2 **Context of operation**

Project GATE recruitment began in September 2003 and continued through July 2005, a period of moderate and declining unemployment while GATE II recruitment was done from January 2009 through December 2010, near the depth of the Great Recession. As such, economic conditions differed across states when their respective programs were operating (see Figure A1

9 SBDCs were created by the Small Business Administration to provide technical assistance services to nascent entrepreneurs and small businesses. SBDCs offered similar services with those offered by Project GATE and at no charge, and thus, program applicants (particularly control cases) could on their own initiative access free workshops and business counseling at local SBDCs. At the time, SBDCs operated in each of the programs' areas of operation – one in each Portland, Lewiston, and Bangor (Maine); two in Minneapolis/St. Paul and one in Duluth (Minnesota); and two in each Philadelphia and Pittsburgh (Pennsylvania). For details, see: https://www.sba.gov/offices/headquarters/osbdc/about-us.

10 Similar to Project GATE programs, GATE II programs implemented checks to ensure that individuals could not reapply for the program and get assigned to the treatment group after they were initially denied services.

11 At the time, 10 SBDCs operated statewide in North Carolina and eight SBDCs operated in Northern Virginia and Richmond. Note that GATE II applicants (particularly those assigned to the control group) could, on their own initiative, obtain similar services as those offered by the GATE II programs at local SBDCs.

in Appendix). Pennsylvania, Minnesota, and Maine had low unemployment and increasing self-employment rates, while North Carolina and Virginia had high (and increasing) unemployment and declining self-employment rates. When programs were operating, earnings for self-employed and wage and salary workers followed positive trends in the Project GATE states and declining trends in GATE II states. There were also notable differences across states over the business cycle, including that self-employment rates were higher than the national rate in Minnesota and Maine and lower than the national rate in Pennsylvania and Virginia. States also differed in the characteristics of unemployed workers (see Table A1 in Appendix).

3.3 **Applicant characteristics**

Table 1 summarizes applicant characteristics based on information from the application form. Among Project GATE programs, Pennsylvania attracted much higher proportions of female, nonwhite, and younger applicants. Minnesota and Maine applicants had similar characteris-

Table 1 Characteristics of program applicants

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Number of applicants	722	869	226	1,175	435
Male	0.546	0.627	0.628	0.558	0.506
Female	0.454	0.373	0.372	0.442	0.494
White	0.414	0.777	0.889	0.600	0.513
Nonwhite	0.586	0.223	0.111	0.400	0.487
Married	0.341	0.514	0.443	0.517	0.503
Disabled	0.061	0.073	0.115	0.057	0.032
18–25 years old	0.039	0.017	0.018	0.024	–
25–34 years old	0.226	0.165	0.173	0.146	–
35–44 years old	0.313	0.345	0.305	0.275	–
45–54 years old	0.314	0.354	0.381	0.317	0.503
55+ years old	0.108	0.119	0.124	0.237	0.497
Missing	–	–	–	0.121	–
No high school diploma	0.042	0.022	0.062	0.066	0.009
High school diploma	0.298	0.167	0.301	0.359	0.103
Some college	0.381	0.358	0.336	0.243	0.297
College degree	0.280	0.454	0.301	0.212	0.591
Self-employment experience	0.226	0.257	0.332	0.313	0.441
Family business	0.639	0.768	0.748	0.491	–
Relevant work experience	0.796	0.829	0.810	0.373	0.885
Business plan	0.235	0.181	0.181	0.116	0.053
Bad/no credit history	0.573	0.331	0.429	0.534	0.205
Family financial support	0.418	0.480	0.473	0.521	0.559
Household income					
Less than $25,000	0.425	0.229	0.407	0.489	0.308
$25,000–$49,999	0.352	0.327	0.367	0.310	0.308
$50,000–$74,999	0.134	0.216	0.146	0.129	0.140
$75,000+	0.089	0.228	0.080	0.072	0.244

Note: Reported are sample proportions.

tics, except that more Minnesota applicants had a college degree. The majority of applicants had no self-employment experience and no business plan, although many had work experience in an industry related to their business idea and in a family business. Many applicants had bad or no credit histories and low annual household incomes, suggesting limited access to financing.

Differences across GATE II programs are more pronounced, which is expected given that Virginia recruited only older unemployed workers. North Carolina applicants were younger and less educated. A large proportion of Virginia applicants had self-employment experience and good credit histories, and many more applicants in Virginia than in North Carolina had household incomes of at least $50,000. North Carolina applicants were older and less educated and had lower household incomes compared to applicants in the Project GATE states. Virginia applicants were older and relatively more of them had a college education and good credit than did Project GATE applicants.

Characteristics comparisons between applicants (Table 1) and the unemployed population (see Table A1 in Appendix) indicate that, in all five states, nonwhites, workers 35–54 years old, college-educated unemployed workers, and individuals with $25,000–49,000 annual household income were overrepresented among applicants. These comparisons suggest that unemployed workers with high levels of human capital and labor market experience were more likely to apply for training. Except for the fact that men were overrepresented in Project GATE states but not in GATE II states (and some other minor differences), there is limited evidence of systematic differences in observed applicant characteristics over the business cycle.

3.4 **Random assignment and follow-up surveys**

Except in North Carolina, all programs randomly assigned about half of the applicants to the treatment; the North Carolina program assigned about 75% (see Table A2 in Appendix, top panel). To assess whether treatment and control groups were balanced in observed characteristics, we estimated regression models in which the dependent variable is an indicator that equals 1 if the individual was assigned to the treatment and zero otherwise. Control variables include those in Table 1 and a constant term. Regression results (see Table A3 in Appendix) show that of the 100 estimated parameters, only one was statistically significant at the 5% level or less and another four were statistically significant at the 10% level. These comparisons indicate that random assignment created treatment and control groups that were generally balanced, with some differences possibly attributed to chance.

All programs administered follow-up surveys, asking applicants about the training they had received since program entry (including program training received from the community for treatment cases and similar training received from the community for control cases) and their labor market outcomes at the time of the survey.[12] Surveys were similar across programs in terms of the information collected but not in the timing of their implementation. Project GATE programs administered surveys at approximately 6, 18, and 60 months after random assignment. GATE II programs each administered one survey, at approximately 24 months in

12 The data made available to us for the analyses did not include any administrative data sources, such as state Unemployment Insurance (UI) data and state UI wage records. Thus, our analyses of program outcomes rely exclusively on the survey data collected by the programs.

Virginia and 32 months in North Carolina. For comparability, our analyses rely on the month 18 survey for Project GATE programs and the single survey for each GATE II program. Survey response rates ranged from 65 to 78% across programs (see Table A2 in Appendix, bottom panel) and varied in some cases by individual characteristics, such as treatment status, age, and education (see Table A4 in Appendix).

The fact that many applicants did not respond to the survey and response rates varied by characteristics raises concerns that the treatment–control balance in characteristics may not have been maintained among respondents, which could lead to biased estimates of program effects. Regression models that estimate treatment assignment based on individual characteristics using survey respondents only (see Table A5 in Appendix) show that survey attrition did not cause imbalanced treatment and control samples among respondents, mitigating concerns that estimated effects would be biased. Another concern is that survey attrition caused some differences in characteristics between program applicants (Table 1) and survey respondents (see Table A6 in Appendix). The implication is that the outcomes of respondents may not be representative of the outcomes for the entire applicant population. To mitigate concerns that estimated effects may be affected by survey attrition (aside from having larger standard errors), we estimate effects using regression models that control for individual characteristics.

4 Methods

The policymakers' motivation for supporting entrepreneurship training was to provide unemployed workers with access to services that would not be otherwise available to them. The expectation was that services would help them overcome obstacles associated with starting and operating a new business, thereby expediting their start-up efforts and reducing the amount of time they remained unemployed. Conceptually, we can identify three potential mechanisms through which entrepreneurship training may affect the outcomes of participants. First, training would educate participants about the different aspects of starting and running a business, helping them to overcome lack of business background. Second, business counseling and financial advice would assist participants to produce viable business plans and secure start-up financing. Third, business counselors may influence the decision of participants to pursue self-employment by encouraging those who lack a viable business idea (or those whom they believed they would not succeed) to consider salary job alternatives. While the first two mechanisms should manifest as improved self-employment rates (and, potentially, improved self-employment earnings), the latter mechanism may reduce self-employment rates and earnings and improve salary employment outcomes instead.

Our analyses first examine program effects on training take-up. Using survey responses, we identify which treatment cases received training from the program and which control cases received similar training from the community. We also measure the number of workshops and business counseling sessions completed by treatment and control individuals. To estimate the effects on training receipt, we estimate regression models of the following form:

$$Y_i = a\,T_i + X_i\,\beta + u_i \tag{1}$$

The dependent variable (Y_i) is the training take-up outcome for applicant *i* and control variables include: an indicator that equals 1 if applicant *i* was assigned to the treatment group

and 0 otherwise (T_i); individual characteristics as reported in Table 1 (X_i); and a zero-mean disturbance term (u_i). The parameter *a* measures the program's effect on training take-up.

Second, we examine whether entrepreneurship training led to improved labor market outcomes for participants. Using survey responses, we measure the employment situation of applicants at the time of the survey, including whether they were self-employed in their own business or self-employed as contractors/freelancers but did not own a business, employed in wage and salary jobs, and employed in any capacity. Information on self-reported earnings is used to measure self-employment, wage and salary, and total monthly earnings at the time of the survey. We also measure whether those who became self-employed hired employees to support their self-employment activities and the number of employees they hired.

Random assignment allows us to estimate each program's ITT effects by fitting model [1] for each outcome of interest. As shown below, in all five experiments, there was substantial control group substitution into training provided in the community, while there was program dropout with many treatment individuals not receiving training. The implication is that ITT effects can severely underestimate the value of receiving training for those who complied with the treatment protocol. Thus, we focus our discussion on LATE estimates, which measure the effects of training for compliers, that is, those who would not have received training in the absence of a government program.

Following Bloom (1984), under the assumption that outcomes are only affected by training and are independent of program assignment, we can estimate LATEs using program assignment as an instrument for the likelihood of receiving training. The first- and second-stage equations are as follows:

$$S_i = \gamma\, T_i + X_i\, \delta + v_i \tag{2}$$

$$Y_i = \varepsilon\, \widetilde{S}_i + X_i\, \zeta + w_i \tag{3}$$

The dependent variable in the first-stage equation (S_i) is an indicator that equals 1 if applicant *i* received any training; control variables include the treatment indicator (T_i) and individual characteristics from Table 1 (X_i). (v_i) is a zero-mean disturbance term. The dependent variable in the second-stage equation is the outcome for individual *i* (Y_i) and control variables include the predicted value of S_i based on the first-stage equation (S_i) and individual characteristics (X_i). (w_i) is a zero-mean disturbance term. Parameter ε is the LATE estimate. Due to differences in state economic contexts and the fact that there was substantial variation across states in the proportion of compliers, we estimate impacts separately for each program (rather than pooling data from programs operating in the same period).

Third, we examine whether program effects varied based on observed characteristics that measure human capital, entrepreneurship skills, and access to financing. For example, to estimate whether program effects varied based on self-employment experience, we separated the sample for each program into those who had self-employment experience and those who did not and then estimated the LATEs separately for each group. We perform this exercise for gender, race, age, education, self-employment experience, credit history, and household income. The discussion of the results in Section 5 focuses only on characteristics for which there is evidence of differential program effects.

5 Results

5.1 Effects on training take-up

Figure 1 presents training take-up rates. Most treatment cases—ranging from 64.3% in North Carolina to 87.4% in Minnesota—received at least one type of training (workshops and or counseling). Many of these participated in both workshops and counseling. Many control cases used training options available in the community, but overall control group training take-up rates were lower than the treatment rates. Moreover, treatment cases participated on average in more workshops and counseling sessions than did control cases (see Table A7 in Appendix). Separate analyses of the marginal and joint distributions of counseling sessions and workshops received (see Tables A8 and A9 in Appendix) show that about half (or more) of the Pennsylvania, Minnesota, and Virginia treatment cases participated in at least four workshops, compared with more than a third in North Carolina and about one-quarter in Maine. Relatively more GATE II treatment cases received at least three counseling sessions than did Project GATE treatment cases.

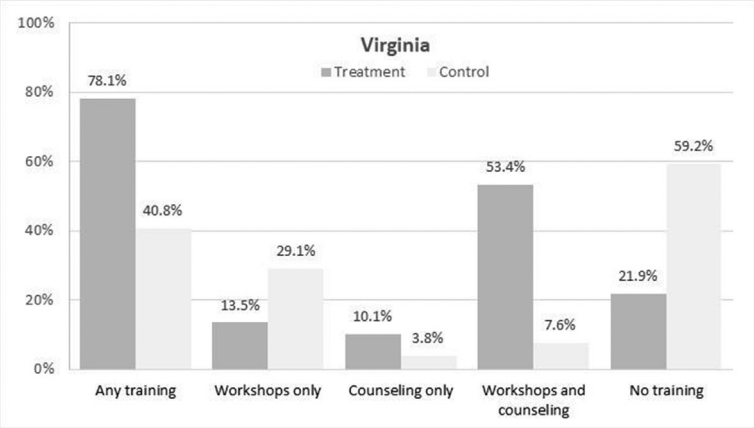
Table 2 presents the effects on training take-up based on model [1]. All programs led to substantial increases in any training receipt ranging from 22.4 percentage points in North Carolina to 42.5 percentage points in Maine. In all states, except Maine, effects were mostly because of increased take-up of both services types; in Maine, the effect was mostly due to increased take-up of counseling only. All programs increased the number of workshops and counseling sessions, with relatively low effects in Maine.

There are two key takeaways from these analyses. One, the five programs increased training take-up (and the quantity of training received), suggesting that government-sponsored programs can be valuable in providing entrepreneurship services to unemployed workers who would not otherwise receive such services. At the same time, there was substantial variation across states in the compliance with the treatment protocol, so the proportion of compliers (measured as the program effect on overall training receipt) ranged widely across programs. Two, there was variation across programs in the level of services received by participants. It appears that Maine participants received a lighter dose of the treatment than participants in other programs, as they participated in relatively fewer workshops. Moreover, GATE II participants exhibited a higher preference for (or GATE II programs provided more emphasis on) business counseling, suggesting that GATE II participants received a heavier dose of the treatment than did Project GATE participants.

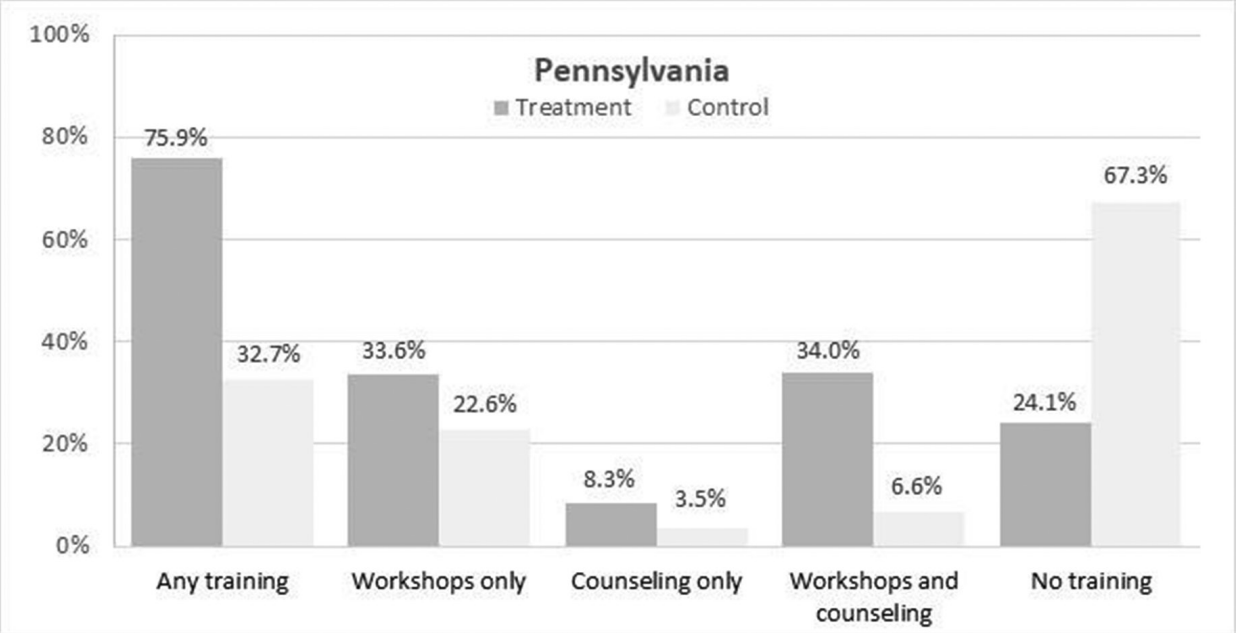
5.2 Effects on labor market outcomes

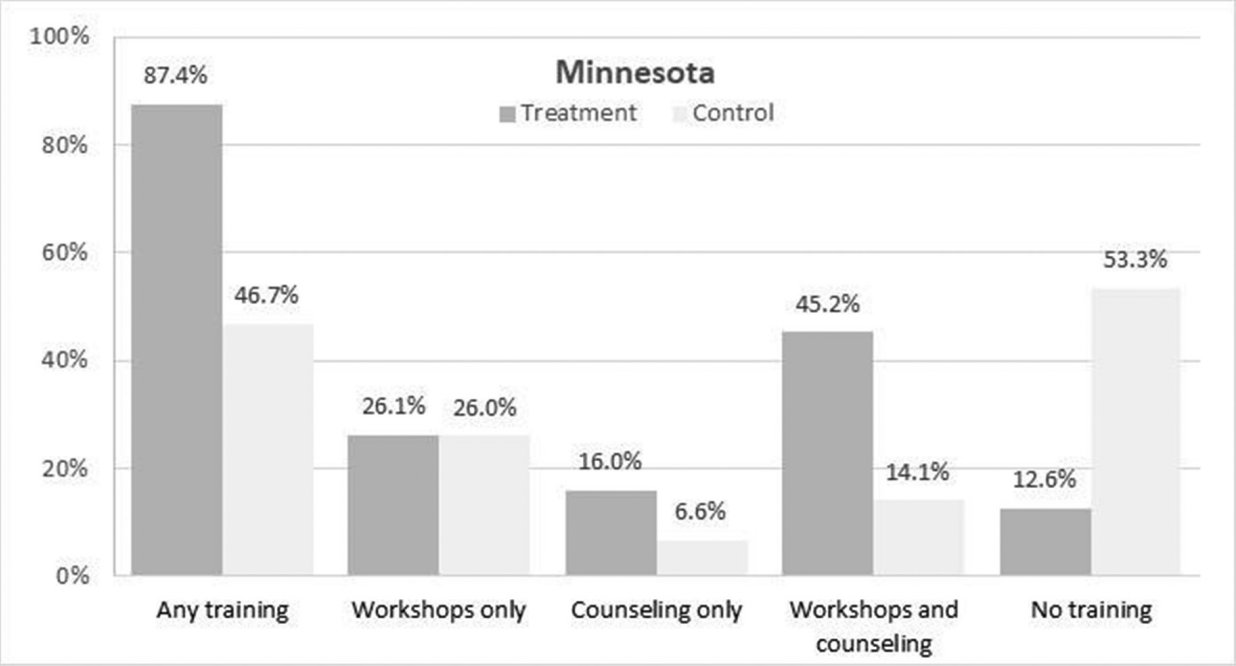
Survey responses are used to construct outcome measures at the time of the survey, including three measures of self-employment status: *self-employment in own business* (indicates self-employment in own business); *self-employment as contractor* (indicates self-employment as a contractor/freelancer (i.e., did not own a business)); and *any self-employment* (indicates any type of self-employment). We also construct wage and salary employment outcomes: *regular employment* (indicates employment in a wage and salary job) and *any employment* (indicates self-employment and/or employment in wage and salary job). In addition, we measure monthly earnings from self-employment, regular employment, and total (self-employment plus regular

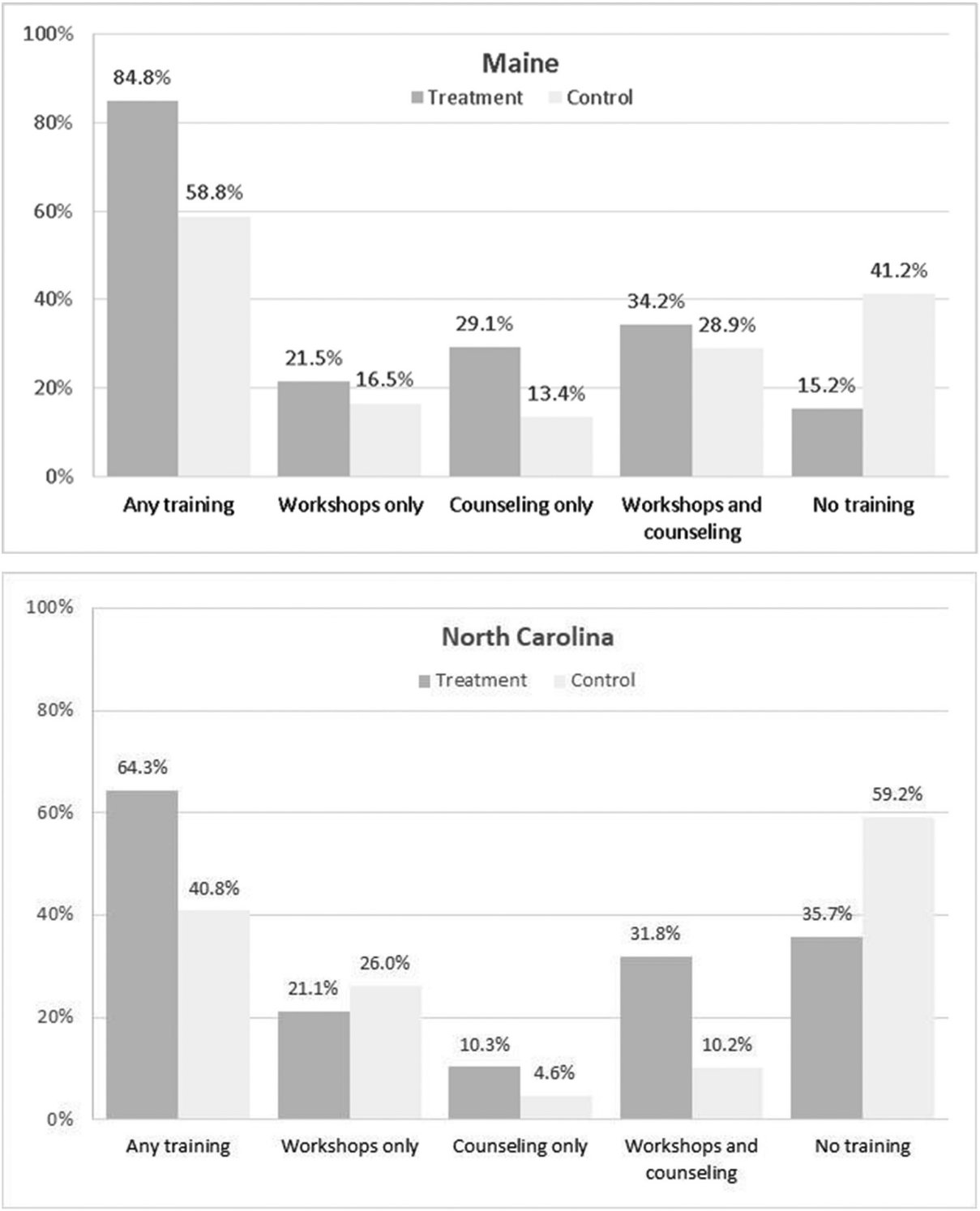
Figure 1 Training take-up rates.



Note: Reported are sample proportions.







earnings). Survey responses are also used to measure the influence that the self-employment activities of applicants had on the employment of other workers: *has employees* (indicates if self-employed individuals hired employees) and *number of employees*. Based on the timing of the surveys, outcomes are measured at month 18 for Project GATE programs, month 24 for Virginia GATE II, and month 32 for North Carolina GATE II.

Table 3 summarizes outcome measures for treatment and control cases; the control means represent average outcomes in the absence of the offer of the government program. In the Project GATE programs, 16.8–25.8% of control individuals were self-employed in their own

Table 2 Program effects on training take-up

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Any training	0.425 (0.042)***	0.391 (0.033)***	0.279 (0.064)***	0.224 (0.039)***	0.361 (0.050)***
Workshops only	0.100 (043)**	−0.004 (0.035)	0.021 (0.063)	−0.052 (0.034)	−0.169 (0.045)***
Counseling only	0.047 (0.022)**	0.084 (0.025)***	0.192 (0.063)***	0.062 (0.023)***	0.061 (0.029)**
Workshops plus counseling	0.278 (0.036)***	0.311 (034)***	0.066 (0.071)	0.205 (0.035)***	0.460 (0.045)***
Number of workshops	3.8 (0.4)***	2.8 (0.3)***	0.3 (0.7)	1.6 (0.2)***	3.4 (0.3)***
Number of counseling sessions	0.9 (0.1)***	0.9 (0.2)***	0.5 (0.3)*	1.5 (0.4)***	2.6 (0.3)***

Note: Reported are estimated treatment effects with robust standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table 3 Labor market outcomes

	Project GATE						GATE II			
	Pennsylvania		**Minnesota**		**Maine**		**North Carolina**		**Virginia**	
	Treatment	**Control**	**Treatment**	**Control**	**Treatment**	**Control**	**Treatment**	**Control**	**Treatment**	**Control**
Self-employment										
in own business	0.203	0.168	0.343	0.235	0.253	0.258	0.164	0.117	0.129	0.114
as contractor	0.104	0.066	0.121	0.144	0.089	0.154	0.129	0.092	0.208	0.152
any self-employment	0.307	0.235	0.463	0.379	0.342	0.412	0.293	0.209	0.337	0.266
Regular employment	0.473	0.509	0.382	0.420	0.494	0.351	0.418	0.474	0.420	0.500
Any employment	0.780	0.743	0.846	0.799	0.835	0.763	0.710	0.684	0.757	0.766
Self-employment earnings	112 (525)	97 (515)	417 (1,286)	329 (1,303)	425 (1,451)	154 (589)	152 (748)	87 (372)	68 (330)	148 (836)
Regular earnings	1,739 (2,464)	1,636 (2,302)	2,305 (4,315)	2,422 (3,650)	2,232 (352)	1,389 (1,713)	504 (1,658)	453 (859)	823 (1,610)	1,480 (6,366)
Total earnings	1,851 (2,493)	1,733 (2,302)	2,722 (4,383)	2,750 (3,735)	2,657 (3,180)	1,542 (1,752)	656 (1,779)	540 (894)	891 (1,678)	1,628 (6,391)
Has employees	0.058	0.062	0.084	0.075	0.152	0.063	0.035	0.020	0.017	0.025
Number of employees	0.18 (0.94)	0.16 (0.88)	0.32 (1.33)	0.27 (1.32)	0.41 (1.14)	0.21 (1.41)	0.14 (1.13)	0.06 (.47)	0.02 (0.18)	0.04 (0.31)

Note: Reported are sample proportions or sample means with standard deviations in parentheses.

businesses and 6.6–15.4% were self-employed as contractors. GATE II control cases were less likely than those in Project GATE to be self-employed in their own business, indicating that it was harder to start a business during the recession. Differences in monthly average earnings reflect differences in labor market conditions and employment rates across the five states.

Table 4 presents LATE parameters.[13] The Pennsylvania program increased overall self-employment by 17.9 percentage points, an effect that was driven partly by an increase in self-employment in own business and partly by an increase in contractor self-employment. In Minnesota, training increased overall self-employment by 19.8 percentage points, driven entirely by a 26.4 percentage-point effect on self-employment in own business. In both programs, training reduced regular employment and increased any employment, although estimates lack statistical significance. Positive effects on overall self-employment did not yield higher earnings in either program nor did they lead to the employment of other workers. In Maine, training increased self-employment in own business by 25.4 percentage points and reduced contractor self-employment by 38.8 percentage points, yielding a negative effect on overall self-employment. Unlike the other two Project GATE programs, training had large positive effects on regular and overall employment, salary and total earnings, and employment of other workers.

The North Carolina GATE II program increased any self-employment by 29.9 percentage points, an effect that is attributed to an increase in both types of self-employment. Results show a reduction in regular employment and increases in individual earnings and employment of other workers, although estimates lack statistical significance. In Virginia, we estimate a positive effect on overall self-employment, driven mostly by an increase in independent self-employment. At the same time, training reduced salary employment, salary earnings, and total earnings.

Table 4 Local average treatment effects on labor market outcomes

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Self-employment					
in own business	0.071 (.086)	.264 (0.089)***	0.254 (0.252)	0.184 (0.133)	0.019 (0.102)
as contractor	0.107 (0.063)*	−0.066 (0.069)	−.388 (.217)*	0.115 (0.117)	0.113 (0.111)
any self-employment	0.179 (0.098)*	0.198 (0.097)**	−0.133 (0.281)	0.299 (0.160)*	0.132 (0.131)
Regular employment	−0.096 (0.111)	−0.128 (0.098)	0.479 (0.287)*	−0.247 (0.180)	−0.181 (0.151)
Any employment	0.083 (0.095)	0.070 (0.076)	0.346 (0.262)	0.052 (0.164)	−0.049 (0.131)
Self-employment earnings	24 (116)	131 (253)	901 (661)	290 (249)	−208 (188)
Regular earnings	207 (528)	−800 (797)	3,086 (1,628)*	181 (559)	−1,871 (1,414)
Total earnings	231 (532)	−669 (796)	3,987 (1,755)**	471 (599)	−2,078 (1,430)
Has employees	−0.003 (054)	−0.008 (0.054)	0.412 (0.194)**	0.056 (0.063)	−0.025 (0.045)
Number of employees	0.08 (0.21)	0.02 (0.26)	0.75 (0.74)	0.42 (0.37)	−0.07 (0.08)
Sample size	*N = 467*	*N = 675*	*N = 176*	*N = 825*	*N = 336*

Note: Reported are estimated LATE parameters with robust standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. The first-stage F-statistic was 0.000 in all cases.

13 See Table A10 in Appendix for corresponding ITT effects.

5.3 **Subgroup analyses**

Previous work suggests that individuals with high levels of education and labor market experience (Fairlie and Meyer, 2000; Hout and Rosen, 2000; Reynolds et al., 2004) and those with self-employment experience or experience working in a family business (Hout and Rosen, 2000; Fairlie and Robb, 2007; Edelman et al., 2010) are more likely to possess the skills and know-how to start successful businesses. There is also evidence that financing constraints may explain why many start-up efforts are unsuccessful and many new businesses fail soon after their creation (Blanchflower et al., 2003; Cavalluzzo and Walken, 2005; Asiedu et al., 2012; Loftstrom and Bates, 2013).

It is thus possible that training may dissuade those who lack human capital and entrepreneurship skills from pursuing self-employment, convincing them to pursue regular employment instead. In contrast, individuals with an entrepreneurship background may have a frame of reference that allows them to derive different benefits from training and make better use of business counseling than those who lack this background. Also, workshops and business counseling may be less beneficial for individuals who have limited access to start-up financing, even in cases when they have a promising business plan and the skills to execute it.

Consider, for example, the results in Maine, where training increased both self-employment in own business and employment in regular jobs, suggesting that training helped some compliers to start a business and may have persuaded others to pursue regular employment instead. It is possible that this heterogeneity occurred based on observed factors. Thus, aggregate effect estimates may hide heterogeneity in training effects based on observed characteristics associated with human capital, business background, and financing access. Effects heterogeneity is an important policy concern: if only individuals with certain traits are likely to succeed if they receive training, policymakers and practitioners can improve program cost-effectiveness by targeting workers with characteristics associated with improved training success.

To investigate effects heterogeneity, we estimated LATEs based on gender, race, age, education, self-employment experience, credit history, and household income. We did not find evidence of differential effects based on gender, race, and household income. Here, we discuss results for four characteristics for which there is evidence of heterogeneity in training effects—self-employment experience, college education, credit history, and age.[14] Results are presented in Table 5 (Project GATE) and in Table 6 (GATE II) and discussed below.[15]

In Pennsylvania, training increased self-employment in own business and any self-employment for those with self-employment experience but had much smaller or no effects for those with no self-employment experience. The increase in self-employment for experienced individuals (although partly offset by a reduction in regular employment) yielded a 26.0 percentage points increase in any employment. There is limited evidence that effects varied based on education, age, and credit access. Similarly, in Minnesota, training increased

14 Note that limited sample sizes do not allow us to estimate with high accuracy effects based on pairwise combinations of characteristics. Separate analyses that attempted such combinations lacked statistical power and are therefore omitted from the paper. Note that, in general, self-employment experience was highly correlated with age (45+ years old) but had low or no correlation with good credit and education (see Table A11 in Appendix).

15 Our analyses test multiple null hypothesis for differential treatment effects based on observed characteristics across the five programs without adjusting inference to account for the possibility that we may falsely reject a true null. Because of the large number of tests performed, many estimates would fail an inference adjustment correction (e.g., using the Bonferroni correction or the Benjamini-Hochberg procedure). Thus, nominally significant results should be interpreted with caution.

Table 5 Local average treatment effects by selected characteristics, Project GATE

	By self-employment experience		By college degree	
	No experience	**With experience**	**No degree**	**With degree**
Pennsylvania	*N = 356*	*N = 111*	*N = 321*	*N = 146*
Self-employment				
in own business	−0.017 (0.102)	0.320 (0.213)	0.070 (0.110)	0.099 (0.160)
as contractor	0.109 (0.066)*	0.146 (0.170)	0.161 (0.084)*	0.067 (0.106)
any self-employment	0.092 (0.113)	0.466 (0.247)*	0.232 (0.130)*	0.165 (0.171)
Regular employment	−0.028 (0.132)	−0.205 (0.255)	−0.129 (0.156)	−0.057 (0.16)
Any employment	0.064 (0.113)	0.260 (0.224)	0.102 (0.135)	0.108 (0.146)
Self-emp. Earnings	3 (120)	151 (349)	91 (128)	25 (241)
Regular earnings	12 (652)	673 (1,034)	−64 (685)	768 (946)
Has employees	−0.045 (0.059)	0.102 (0.158)	−0.060 (0.077)	0.106 (0.081)
Number of employees	−0.10 (0.25)	0.72 (0.51)	−0.00 (0.03)	0.38 (0.41)
Minnesota	*N = 493*	*N = 182*	*N = 347*	*N = 328*
Self-employment				
in own business	0.172 (0.103)*	0.498 (0.183)***	0.169 (0.108)	0.425 (0.151)***
as contractor	−0.045 (0.083)	−0.121 (0.134)	−0.046 (0.091)	−0.092 (0.108)
any self-employment	0.127 (0.118)	0.376 (0.183)**	0.122 (0.122)	0.333 (0.160)**
Regular employment	−0.148 (0.123)	−0.150 (0.173)	−0.220 (0.126)*	−0.024 (0.158)
Any employment	−0.022 (0.092)	0.226 (0.134)*	−0.107 (0.104)	0.309 (0.120)**
Self-emp. Earnings	154 (343)	252 (295)	226 (258)	122 (480)
Regular earnings	−1,290 (1,091)	559 (836)	−459 (787)	−1,093 (1,516)
Has employees	0.005 (0.068)	−0.024 (0.096)	0.068 (0.073)	−0.076 (0.083)
Number of employees	0.08 (0.33)	0.07 (0.46)	0.44 (0.38)	−0.34 (0.36)
Maine	*N = 120*	*N = 56*	*N = 117*	*N = 59*
Self-employment				
in own business	−0.002 (0.222)	0.364 (0.273)	0.250 (0.186)	−0.072 (0.224)
as contractor	−0.123 (0.236)	−0.438 (0.247)*	−0.095 (0.162)	−0.409 (0.204)**
any self-employment	−0.125 (0.271)	−0.074 (0.261)	0.155 (0.196)	−0.482 (0.228)**
Salary employment	0.528 (0.266)*	0.083 (0.333)	0.221 (0.201)	0.624 (0.292)**
Any employment	0.403 (0.235)*	−0.009 (0. 0.354)	0.376 (0.283)	0.142 (0.314)
Self-Emp. Earnings	−128 (607)	4,237 (3,752)	1,168 (728)	957 (2,523)
Salary earnings	7,025 (3,139)**	−4,925 (3,084)	1,885 (1,425)	9,280 (4,961)*
Has employees	0.120 (0.216)	0.531 (0.310)*	0.605 (0.191)***	0.181 (0.224)
Number of employees	0.14 (0.12)	1.92 (0.94)*	0.98 (0.46)**	0.27 (0.41)
	By Credit Access		By Age	
	Bad Credit	Good Credit	<45 Years	45+ Years
Pennsylvania	*N = 256*	*N = 211*	*N = 242*	*N = 225*
Self-employment				
in own business	0.199 (0.131)	−0.032 (0.117)	0.177 (0.128)	−0.007 (0.123)
as contractor	0.024 (0.094)	0.223 (0.083)***	0.072 (0.093)	0.129 (0.090)
any self-employment	0.223 (0.145)	0.192 (0.130)	0.249 (0.146)*	0.122 (0.140)
Salary employment	−0.077 (0.171)	−0.135 (0.137)	−0.116 (0.175)	−0.069 (0.150)
Any employment	0.146 (0.147)	0.057 (0.119)	0.133 (0.146)	0.052 (0.135)
Self-Emp. Earnings	131 (157)	−21 (170)	63 (176)	13 (160)
Salary earnings	97 (738)	−50 (718)	−769 (923)	946 (563)
Has employees	0.046 (085)	−0.022 (0.069)	−0.046 (0.083)	0.018 (0.074)
Number of employees	0.45 (0.33)	−0.10 (0.27)	−0.07 (0.31)	0.11 (0.30)

(*continued*)

Table 5 Continued

	By self-employment experience		By college degree	
	No experience	**With experience**	**No degree**	**With degree**
Minnesota	*N = 197*	*N = 478*	*N = 327*	*N = 348*
Self-employment				
in own business	−0.063 (0.150)	0.375 (0.107)***	0.324 (0.153)**	0.235 (0.109)**
as contractor	−0.077 (0.142)	−0.079 (0.078)	−0.086 (0.121)	−0.070 (0.083)
any self-employment	−0.140 (0.185)	0.296 (0.113)***	0.238 (0.167)	0.165 (0.118)
Salary employment	0.113 (0.206)	−0.209 (0.111)*	−0.363 (178)**	0.023 (0.116)
Any employment	−0.027 (0.160)	0.087 (0.086)	−0.125 (0.131)	0.188 (0.096)*
Self-Emp. Earnings	147 (284)	70 (328)	999 (437)**	−415 (328)
Salary earnings	−1,010 (1,309)	−619 (978)	−2,096 (1,510)	−92 (875)
Has employees	−0.132 (0.107)	0.025 (0.063)	0.027 (0.096)	−0.049 (0.065)
Number of employees	−0.29 (0.37)	0.12 (0.33)	−0.30 (0.45)	0.10 (0.33)
Maine	*N = 68*	*N = 108*	*N = 86*	*N = 90*
Self-employment				
in own business	0.461 (0.220)**	−0.068 (0.341)	0.191 (0.267)	0.157 (0.332)
as contractor	−0.403 (0.238)*	−0.138 (0.309)	−0.003 (0.291)	−0.524 (0.318)
any self-employment	0.058 (0.255)	−0.235 (0.352)	0.189 (0.295)	−0.367 (0.334)
Salary employment	−0.054 (0.259)	0.596 (0.315)*	0.259 (0.249)	0.495 (0.301)
Any employment	0.034 (0.239)	0.361 (0.290)	0.448 (0.230)*	0.128 (0.286)
Self-Emp. Earnings	2,158 (1,888)	611 (1,099)	354 (776)	1,557 (1,405)
Salary earnings	1,466 (3,238)	5,004 (2,402)**	4,209 (1,845)**	3,990 (3,365)
Has employees	0.597 (0.329)*	0.143 (0.376)	0.464 (,260)*	0.221 (0.433)
Number of employees	0.92 (0.52)*	0.31 (0.46)	1.07 (1.08)	0.51 (1.3)

Note: Reported are estimated LATE parameters with robust standard errors in parentheses. *N* is the sample size. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. The first-stage F-statistic was 0.000 in all cases except for a few characteristics in Maine (0.079 for self-employment experience, 0.128 for college degree, and 0.047 for bad credit).

self-employment in own business by 49.8 percentage points and any self-employment by 37.6 percentage points for those with self-employment experience. Effects for those with no self-employment experience were much smaller. Training also increased self-employment in own business for individuals with a college degree or with good credit but had much lower effects for those with no college degree or bad credit.

The Maine results show different effects based on observed characteristics, although small sample sizes limit statistical power. Effects on regular employment were large and statistically different from zero for those with no self-employment experience, a college degree, and good credit. These groups experienced large gains in regular earnings. On the other hand, training increased self-employment in own business and reduced contractor self-employment for those with self-employment experience, no college degree, and bad credit. These individuals were also more likely to hire employees to support their business operations.

In North Carolina, training had much higher effects on self-employment for individuals with no self-employment experience than for experienced individuals. Training increased overall self-employment for experienced individuals by 42.3 percentage points, an effect that was due to increases in both types of self-employment. This effect was largely offset by a reduction in regular employment. Training seems to have been more effective for individuals under

Table 6 Effects by selected characteristics, GATE II

	By self-employment experience		By college degree	
	No self-employment experience	**Self-employment experience**	**No college degree**	**College degree**
North Carolina	*N = 559*	*N = 266*	*N = 591*	*N = 234*
Self-employment				
in own business	0.262 (0.178)	0.015 (0.197)	0.068 (0.140)	0.263 (0.242)
as contractor	0.161 (0.140)	0.074 (0.203)	0.145 (0.122)	0.111 (0.410)
any self-employment	0.423 (0.209)**	0.089 (0.248)	0.213 (0.167)	0.374 (0.330)
Salary employment	−0.343 (0.243)	−0.070 (0.256)	−0.262 (0.194)	0.172 (0.244)
Any employment	0.080 (0.223)	0.018 (0.231)	−0.048 (0.181)	0.546 (0.309)
Self-Emp. earnings	292 (327)	291 (382)	0.299 (253)	1,028 (1,707)
Salary earnings	547 (857)	−227 (577)	476 (694)	−1,194 (1,688)
Has employees	0.143 (0.159)	−0.005 (0.094)	0.081 (0.070)	0.033 (0.047)
Number of employees	0.29 (0.17)	0.05 (0.07)	0.48 (0.44)	−0.31 (1.83)
Virginia	*N = 190*	*N = 146*	*N = 126*	*N = 210*
Self-employment				
in own business	0.200 (0.114)*	−0.271 (0.259)	−0.067 (0.212)	0.073 (0.125)
as contractor	0.128 (0.091)	0.004 (0.319)	−0.171 (0.250)	0.159 (0.133)
any self-employment	0.328 (0.140)**	−0.266 (0.348)	−0.237 (0.310)	0.232 (0.156)
Salary employment	−0.250 (0.185)	0.078 (0.328)	−0.210 (0.347)	−0.159 (0.173)
Any employment	0.078 (0.167)	−0.188 (0.259)	−0.448 (0.335)	0.073 (0.151)
Self-Emp. earnings	148 (87)*	−647 (620)	−509 (354)	−102 (245)
Salary earnings	−1,849 (2,159)	−720 (830)	−9,395 (5,619)*	111 (603)
Has employees	0.037 (0.060)	−0.163 (0.094)*	0.009 (0.088)	−0.039 (0.055)
Number of employees	0.06 (0.08)	−0.41 (0.24)*	−0.15 (0.21)	−0.06 (0.08)
	By Credit Access		By Age	
	Bad Credit	Good Credit	<45 Years	45+ Years
North Carolina	*N = 422*	*N = 403*	*N = 341*	*N = 484*
Self-employment				
in own business	0.310 (0.205)	0.039 (0.181)	0.377 (0.274)	0.090 (0.165)
as contractor	0.039 (0.187)	0.145 (0.150)	0.241 (0.224)	0.063 (0.147)
any self-employment	0.349 (0.253)	0.184 (0.206)	0.618 (0.327)*	0.153 (0.202)
Salary employment	−0.440 (0.304)	−0.069 (0.226)	−0.267 (0.344)	−0.261 (0.228)
Any employment	−0.091 (0.281)	0.115 (0.194)	0.351 (0.330)	−0.108 (0.207)
Self-Emp. earnings	303 (464)	277 (261)	672 (536)	47 (289)
Salary earnings	−62 (1,114)	257 (476)	821 (1,440)	−135 (500)
Has employees	−0.098 (0.097)	0.170 (0.088)*	0.125 (0.120)	0.027 (0.082)
Number of employees	−0.29 (0.29)	0.76 (0.63)	1.23 (1.02)	0.06 (0.34)
Virginia	*N = 67*	*N = 269*	*N = 0*	*N = 336*
Self-employment				
in own business	0.217 (0.424)	−0.015 (0.099)	–	0.019 (0.102)
as contractor	−0.721 (0.654)	0.227 (0.114)**	–	0.113 (0.111)
any self-employment	−.504 (0.670)	0.213 (0.133)	–	0.132 (0.131)
Salary employment	0.442 (0.686)	−0.246 (0.154)	–	−0.181 (0.151)
Any employment	−0.062 (0.465)	−0.013 (0.133)	–	−0.036 (0.130)
Self-Emp. earnings	−616 (858)	−141 (188)		−208 (188)
Salary earnings	198 (1,210)	−2,013 (1,572)		−1,871 (1,414)
Has employees	−0.037 (0.062)	−0.014 (0.051)	–	−0.025 (0.045)
Number of employees	−0.08 (0.09)	−0.05 (0.08)	–	−0.07 (.08)

Note: Reported are estimated LATE parameters with standard errors in parentheses. *N* is the sample size. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. The first-stage F-statistic was 0.000 in all cases except for: in North Carolina (0.094 for self-employment experience and 0.065 for age); and in Virginia (0.080 for no self-employment experience and 0.062 for no college degree).

45 years old—in this case, training increased self-employment by 61.8 percentage points, any employment by 35.1 percentage points, and the likelihood of hiring employees by 12.5 percentage points.

The Virginia results reveal effects not identified by the aggregate results. Training increased overall self-employment for those with no self-employment experience by 32.8 percentage points, an effect that was largely offset by a reduction in regular employment. Training also yielded small positive effects on self-employment earnings and large negative effects on total earnings for inexperienced individuals. There is also evidence that training may have increased self-employment rates and reduced earnings for individuals with a college degree or good credit history, although estimates for these groups lacked statistical significance.

5.4 **Cost–benefit considerations**

Although a full cost–benefit analysis is beyond the scope of this study, we outline some of the benefits (and costs) for compliers and discuss considerations for assessing the costs and benefits from the society's perspective. From the compliers' perspective, an important program benefit is that they were able to access free training through the programs, so that they enjoyed the benefits of training (which they would not have received in the absence of the program) without incurring the associated pecuniary costs. Benefits for compliers would also include any improvements in earnings resulting from training participation. Effects on earnings are ambiguous. We estimate positive effects on self-employment, regular, and total earnings in Pennsylvania and North Carolina and negative effects in Minnesota and Virginia. In Maine, we estimate large and positive effects on regular and total earnings. Note that, on average, treated individuals in the three Project GATE programs were able to achieve self-sufficiency, with the average annualized total earnings in Pennsylvania ($20,676), Minnesota ($31,080), and Maine ($27,588) exceeding the federal poverty limits.[16] In contrast, the average annualized total earnings for GATE II treated individuals in North Carolina ($7,344) and Virginia ($10,956) were below and just above the one-person household poverty limits, respectively.[17]

Self-employed workers may derive much greater levels of job satisfaction than those employed in regular jobs because they value the day-to-day activities, flexibility, and financial independence associated with self-employment (Douglas and Shepherd, 2002; Benz and Frey, 2008; 2009; Fuchs-Schündeln, 2009). Program applicants revealed a strong preference for self-employment, so compliers who became self-employed because of the program may have experienced substantial utility gains. We would thus conclude that compliers in Pennsylvania and North Carolina, who achieved higher self-employment rates and higher earnings as a result of the program, experienced large welfare gains. By the same token, positive effects on regular earnings in Maine may have offset any welfare losses caused by the reduction in

16 The federal poverty limit in 2008 ranged from $10,400 for a one-person household to $21,200 for a four-person household (source: https://aspe.hhs.gov/2008-poverty-guidelines-federal-register-notice). In 2008, around the time when the surveys begun, average total earnings (self-employment plus salary earnings) for employed workers was $42,829 in Pennsylvania, $43,828 in Minnesota, and $35,984 in Maine (source: Authors' tabulations of the American Community Survey).

17 The federal poverty limit in 2012 ranged from $11,170 for a one-person household to $23,050 for a four-person household (source: https://aspe.hhs.gov/2012-hhs-poverty-guidelines). Tabulations of the American Community Survey show that, in 2012, around the time when the surveys begun, average total earnings were $43,700 in North Carolina and $66,187 in Virginia (workers 45+ years old).

self-employment. Similarly, the small earnings decline in Minnesota may have been offset by the increase in overall self-employment. It is uncertain whether the increase in self-employment in Virginia was sufficient to offset the large decrease in earnings.

Overall, our findings suggest that compliers in at least four of the five programs may have experienced positive welfare gains. A more complete analysis would take into account the personal costs of participating in the programs (including pecuniary costs such as travel costs and lost wages and nonpecuniary costs, such as loss of leisure) and other potential benefits deriving from self-employment, such as the employment of family members and business tax write-offs.

Assessing the costs and benefits of the program from the society's perspective is complicated by lack of appropriate data and other considerations. Program benefits from the society's perspective would include any welfare gains for participants as well as any savings in UI and other social assistance benefits because participants were able to secure employment. Another potential society benefit is that the self-employment activities of compliers led to the creation of new jobs and the employment of other workers. The Maine and North Carolina results provide evidence that such spillover employment effects are possible. Also, to the extent that the self-employment activities of compliers created new markets and revenue streams, then society benefits would include the expansion of the tax base. Society's costs include the cost of recruiting and providing services to participants, estimated at $1,258 in Pennsylvania, $1,027 in Minnesota, and $2,342 in Maine (Benus et al., 2010). GATE II costs have not been made public. Society's costs would also include any displacement effects occurring because training helped individuals to start businesses at the expense of interested unemployed workers with similar business ideas and no access to training. If displacement effects exist in this context, we would expect them to be relatively more important during recessions.

6 Conclusions

Our findings show that government-sponsored entrepreneurship training programs increased training take-up among unemployed workers at both stages of the business cycle. Evidently, program participants during the recession received a higher dose of the intervention than did participants in a good economy, suggesting that demand for training may be higher in a weak economy. At the same time, the finding that many control individuals received similar training from the community—both before and during the recession—suggests that government-sponsored training partially crowded out training options available in the community.

Analyses show that training helped compliers in Pennsylvania and Minnesota to start businesses and become self-employed. These effects were accompanied by reductions in wage and salary employment, indicating that training essentially aided the business start-up efforts of those who would have found regular jobs in the programs' absence. These effects occurred primarily for individuals with self-employment experience. A potential explanation is that these individuals derive higher benefits from training and counseling or simply that they are more committed to starting a business when the economy is relatively strong, compared with individuals who have little practical understanding of the demands of running a business and who may prefer pursuing (attractive) salary employment options.

In Maine, training reduced contractor and overall self-employment and increased regular employment and earnings. Further analyses reveal that these effects occurred mainly for

individuals with no self-employment experience, suggesting that training persuaded those who lacked relevant experience but presumably had good labor market alternatives to pursue regular employment instead of becoming self-employed as independent contractors. The same analyses indicate that training increased self-employment in own business for those with self-employment experience, an effect that was accompanied by a reduction in independent self-employment and an increase in the employment of other workers. These results suggest that training helped those with prior self-employment experience (who would otherwise be independently self-employed) to start a business and hire employees to support those businesses.

Impact disparities across Project GATE states are in some ways consistent with the observed patterns in services received. Maine participants were at least as likely as Minnesota and Pennsylvania participants to receive counseling but much less likely to receive multiple workshop training sessions. This pattern suggests that the Maine program may have provided more emphasis on advising participants about the pros and cons of self-employment and whether they should pursue self-employment when attractive regular jobs are available. As a result, Maine participants who realized during counseling that self-employment may not be the best option for them exited the program earlier (and thus received a lower treatment dose) than their Pennsylvania and Minnesota peers.

Earlier studies of Project GATE pooled data from all three states and did not distinguish between self-employment in own business and contractor self-employment (Michaelides and Benus, 2012; Fairlie et al., 2015; Michaelides, 2020). Those studies showed that training had small impacts on self-employment rates and no impacts on total employment. However, they missed underlying impact differences across states and did not identify the mechanisms discussed above, including that training was more effective for experienced individuals or that training may have persuaded others to pursue regular employment instead.

Analyses of the North Carolina and Virginia GATE II programs provide benchmark evidence about the efficacy of entrepreneurship training during recessions. Training increased self-employment rates, but effects were largely offset by reductions in regular employment. Further analyses suggest that training helped those with no self-employment experience to become self-employed but had no effects for those with prior experience. Positive effects on self-employment for inexperienced individuals were partly offset by reductions in regular employment. Training also increased the employment of other workers in North Carolina, suggesting that inexperienced individuals who became self-employed as a result of the program were likely to hire workers to support their self-employment activities.

These findings indicate that the primary effect of entrepreneurship training during a recession is to help unemployed workers with no self-employment experience to overcome the knowledge gap associated with starting a business. It is possible that, in a weak economy, self-employment attracts relatively more workers with the skills and motivation to become business owners but who would face high opportunity costs to pursue self-employment in a good economy (when attractive regular jobs are available). Among these are individuals who had not engaged in self-employment activities in the past, but lack of attractive salary options during a recession may push them to consider self-employment; our findings suggest that these individuals may derive substantial benefits from training. This finding is consistent with the fact that, on average, GATE II participants participated in multiple workshops and completed more

counseling sessions than did Project GATE participants, revealing a higher need for training support.

Our findings lead to four general conclusions. First, government-sponsored entrepreneurship training programs may offer the opportunity to many unemployed workers to receive training that they would not have otherwise received. However, before implementing such programs, policymakers should carefully assess whether a government option would displace programs that are already available in the community. Second, in a strong economy, training may help individuals with prior self-employment experience to start their own business instead of finding a salary job while it may persuade those with attractive salary job alternatives to pursue salary employment instead. If both mechanisms are in effect, it is possible that training may lead to improved overall employment rates and earnings. Third, during recessions, training may help those who had not previously engaged in self-employment to become self-employed and, potentially, hire other workers to support their self-employment activities. However, in most cases, these effects occur for those who would have otherwise found salary jobs and are accompanied by close-to-zero or negative earnings effects. Finally, our findings provide weak evidence that entrepreneurship training can improve overall employment, so it is unlikely that it represents an effective policy for combating unemployment, particularly in the context of a weak labor market.

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Appendix

Table A1 Characteristics of unemployed workers

	Unemployed workers in 2003			Unemployed workers in 2009	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**[†]
Unemployment rate	0.064	0.049	0.051	0.098	0.063
Male	0.527	0.579	0.515	0.557	0.545
White	0.797	0.849	0.947	0.649	0.707
Married	0.410	0.391	0.511	0.398	0.552
18–25 years old	0.215	0.258	0.194	0.229	–
25–34 years old	0.207	0.192	0.194	0.201	–
35–44 years old	0.225	0.218	0.207	0.186	–
45–54 years old	0.207	0.192	0.242	0.217	0.579
55+ years old	0.147	0.140	0.163	0.167	0.420
No high school diploma	0.131	0.122	0.119	0.178	0.170
High school diploma	0.508	0.437	0.520	0.434	0.373
Some college	0.184	0.225	0.203	0.250	0.206
College degree	0.176	0.220	0.159	0.139	0.252
Less than $25,000	0.376	0.319	0.423	0.449	0.453
$25,000–$49,999	0.291	0.275	0.286	0.266	0.212
$50,000–$74,999	0.161	0.179	0.159	0.147	0.139
$75,000+	0.172	0.227	0.132	0.138	0.196

[†] The Virginia figures are for workers who were at least 45 years old.

Note: Reported are sample proportions.

Source: Authors' tabulations of the American Community Survey data.

Table A2 Random assignment of program applicants and survey response

	All applicants	**Treatment group**	**Control group**
Project GATE			
Pennsylvania	722 (100%)	352 (49%)	370 (51%)
Minnesota	869 (100%)	430 (49%)	439 (51%)
Maine	226 (100%)	106 (47%)	120 (53%)
GATE II			
North Carolina	1,175 (100%)	881 (75%)	294 (25%)
Virginia	435 (100%)	218 (50%)	217 (50%)
	Survey respondents	**Treatment group**	**Control group**
Project GATE			
Pennsylvania	467 [65%]	241 [68%]	226 [61%]
Minnesota	675 [78%]	356 [83%]	319 [73%]
Maine	176 [78%]	79 [75%]	97 [81%]
GATE II			
North Carolina	825 [70%]	629 [71%]	196 [67%]
Virginia	336 [77%]	178 [82%]	158 [72%]

Note: The top panel reports numbers of applicants with proportions of all applicants in parentheses. The bottom panel reports numbers of survey respondents with survey response rates (number of respondents divided by number of applicants) in brackets.

Table A3 Regression results, treatment likelihood

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Male	0.006 (0.040)	0.050 (0.036)	-0.116 (0.073)	−0.064 (0.030)**	0.101 (0.054)*
White	0.044 (0.048)	0.048 (0.044)	−0.181 (0.114)	0.009 (0.031)	−0.022 (0.051)
Married	0.011 (0.049)	−0.003 (0.046)	0.126 (0.087)	0.012 (0.034)	0.001 (0.061)
Disabled	0.001 (0.080)	0.019 (0.067)	0.036 (0.112)	−0.065 (0.063)	−0.117 (0.142)
Age: 18–25 years	–	–	–	–	–
Age: 25–34 years	0.144 (0.105)	−0.143 (0.138)	−0.230 (0.269)	−0.171 (0.115)	–
Age: 35–44 years	0.103 (0.104)	−0.172 (0.136)	−0.375 (0.263)	−0.136 (0.113)	–
Age: 45–54 years	0.205 (0.106)*	−0.241 (0.136)	−0.346 (0.264)	−0.170 (0.113)	–
Age: 55+ years	0.076 (0.116)	−0.279 (0.145)	−0.452 (0.288)	−0.120 (0.114)	−0.003 (0.049)
No high school diploma	–	–	–	–	–
High school diploma	−0.080 (0.100)	0.070 (0.124)	0.017 (0.154)	−0.042 (0.057)	−0.105 (0.266)
Some college	−0.093 (0.099)	0.071 (0.121)	0.060 (0.156)	−0.027 (0.059)	0.043 (0.257)
College degree	−0.047 (0.104)	0.040 (0.121)	0.083 (0.160)	−0.010 (0.062)	0.026 (0.254)
Self-employment experience	−0.017 (0.047)	−0.025 (0.041)	0.047 (0.076)	0.008 (0.032)	0.065 (0.050)
Family business	−0.068 (0.048)	0.028 (0.046)	−0.026 (0.088)	0.008 (0.028)	–
Relevant work experience	0.062 (0.040)	0.035 (0.041)	−0.002 (0.083)	0.028 (0.030)	0.064 (0.076)
Business plan	0.015 (0.045)	−0.073 (0.045)	0.045 (0.095)	−0.032 (0.043)	−0.166 (0.110)
Bad/no credit history	−0.019 (0.043)	0.037 (0.040)	.094 (0.075)	−0.021 (0.038)	0.032 (0.064)
Family financial support	0.040 (0.043)	0.065 (0.042)	−0.070 (0.078)	−0.040 (0.031)	0.058 (0.054)
Household income					
Less than $25,000	–	–	–	–	–
$25,000–$49,999	−0.018 (0.043)	0.083 (0.048)*	−0.090 (0.088)	0.019 (0.034)	−0.057 (0.064)
$50,000–$74,999	−0.087 (0.067)	0.090 (0.058)	−0.090 (0.088)	−0.020 (0.049)	−0.101 (0.086)
$75,000+	−0.129 (0.081)	0.058 (0.061)	0.004 (0.155)	0.113 (0.061)*	−0.036 (0.075)
Constant	0.470 (0.138)***	0.416 (0.181)**	0.983 (0.383)***	0.949 (0.121)***	0.380 (0.270)
R-squared	0.0297	0.0329	0.0881	0.0212	0.0334
Observations	722	869	226	1,175	435

Note: Dependent variable is the likelihood of treatment group assignment. Reported are estimated parameters with robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table A4 Regression results, likelihood of survey response

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Treatment	0.067 (0.036)*	0.084 (0.027)***	−0.029 (0.057)	0.035 (0.030)	0.091 (0.040)**
Male	−0.042 (0.037)	−0.070 (0.029)**	−0.097 (0.061)	−0.081 (0.028)***	−0.057 (0.045)
White	−0.020 (0.046)	−0.049 (0.035)	0.117 (0.094)	−0.010 (0.029)	−0.018 (0.042)
Married	0.010 (0.046)	0.081 (0.037)**	0.029 (0.072)	0.010 (0.031)	−0.108 (0.050)**
Disabled	0.080 (0.075)	0.036 (0.053)	−0.137 (0.065)**	0.129 (0.057)**	0.148 (0.117)
Age: 18–25 years	−0.101 (0.098)	0.040 (0.108)	−0.094 (0.217)	0.021 (0.093)	–
Age: 25–34 years	−0.042 (0.049)	−0.080 (0.041)*	−0.188 (0.086)**	−0.058 (0.042)	–
Age: 35–44 years	–	–	–	–	–
Age: 45–54 years	0.108 (0.046)**	0.062 (0.034)*	−0.113 (0.070)	0.007 (0.043)	–
Age: 55+ years	0.081 (0.065)	0.108 (0.049)**	−0.110 (0.097)	0.064 (0.046)	–
No high school diploma	–	–	–	–	–
High school diploma	−0.073 (0.094)	0.177 (0.099)*	−0.059 (0.126)	−0.040 (0.049)	−0.105 (0.219)
Some college	0.041 (0.105)	0.149 (0.096)	−0.090 (0.127)	−0.073 (0.061)	−0.007 (0.220)
College degree	−0.017 (0.102)	0.190 (0.099)*	−0.003 (0.146)	−0.099 (0.040)**	0.067 (0.210)
Self-employment experience	0.008 (0.044)	0.012 (0.033)	−0.037 (0.062)	0.023 (0.030)	−0.024 (0.041)
Family business	0.075 (0.038)**	0.077 (0.032)**	0.008 (0.068)	−0.021 (0.027)	–
Relevant work experience	−0.008 (0.045)	−0.021 (0.037)	−0.030 (0.072)	−0.034 (0.029)	0.042 (0.038)
Business plan	−0.074 (0.043)*	−0.057 (0.036)	−0.018 (0.078)	0.002 (0.041)	0.013 (0.091)
Bad/no credit history	−0.019 (0.040)	−0.069 (0.032)**	−0.094 (0.062)	0.021 (0.028)	0.032 (0.024)
Family financial support	−0.021 (0.041)	0.000 (0.034)	−0.002 (0.064)	0.032 (0.029)	0.015 (0.045)
Household income					
Less than $25,000	–	–	–	–	–
$25,000–$49,999	−0.023 (0.043)	−0.043 (0.039)	−0.090 (0.072)	0.076 (0.032)**	−0.010 (0.053)
$50,000–$74,999	−0.013 (0.063)	−0.096 (0.046)**	0.126 (0.103)	0.060 (0.044)	0.031 (0.071)
$75,000+	0.067 (0.076)	−0.070 (0.049)	0.145 (0.127)	0.170 (0.058)***	0.110 (0.062)*
Constant	0.609 (0.111)***	0.420 (0.121)***	0.921 (0.186)***	0.804 (0.069)***	0.726 (0.224)***
R-squared	0.0623	0.1041	0.0932	0.0609	0.0656

Note: Dependent variable is the likelihood of survey response. Reported are estimated parameters with robust standard errors in parentheses.

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table A5 Regression results, treatment likelihood, survey respondents

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Male	0.015 (0.050)	0.049 (0.041)	−0.134 (0.085)	−0.061 (0.035)*	0.093 (0.062)
White	0.052 (0.061)	0.039 (0.051)	−0.028 (0.141)	0.031 (0.037)	−0.031 (0.058)
Married	0.005 (0.061)	0.016 (0.054)	0.074 (0.100)	0.016 (0.041)	0.032 (0.070)
Disabled	0.053 (0.097)	−0.001 (0.044)	0.009 (0.126)	−0.111 (0.071)	−0.083 (0.153)
Age: 18–25 years	−0.179 (0.151)	0.168 (0.161)	0.310 (0.301)	0.075 (0.129)	–
Age: 25–34 years	0.001 (0.069)	−0.035 (0.062)	0.122 (0.125)	−0.035 (0.055)	–
Age: 35–44 years	–	–	–	–	–
Age: 45–54 years	0.066 (0.060)	−0.067 (0.048)	0.026 (0.095)	−0.008 (0.045)	–
Age: 55+ years	−0.043 (0.084)	−0.106 (0.067)	−0.103 (0.134)	0.033 (0.048)	−0.016 (0.056)
No high school diploma	–	–	–	–	–
High school diploma	−0.196 (0.126)	0.173 (0.163)	−0.139 (0.177)	−0.005 (0.068)	−0.319 (0.311)
Some college	−0.172 (0.124)	0.192 (0.159)	−0.126 (0.178)	0.003 (0.070)	−0.092 (0.299)
College degree	−0.175 (0.135)	0.140 (0.163)	−0.060 (0.193)	0.014 (0.072)	−0.127 (0.295)
Self-employment experience	−0.085 (0.058)	−0.002 (0.045)	−0.018 (0.087)	−0.007 (0.038)	.076 (0.057)
Family business	0.069 (0.051)	0.028 (0.048)	−0.067 (0.098)	0.001 (0.034)	–
Relevant work experience	−0.069 (0.059)	0.058 (0.052)	0.156 (0.111)	0.042 (0.036)	0.123 (0.090)
Business plan	0.021 (0.059)	−0.068 (0.052)	0.154 (0.111)	0.047 (0.051)	−0.141 (0.129)
Bad/no credit history	−0.080 (0.053)	0.057 (0.046)	0.171 (0.098)	−0.019 (0.041)	0.034 (0.072)
Family financial support	0.055 (0.055)	0.038 (0.049)	−0.021 (0.091)	036 (0.037)	0.041 (0.063)
Household income					
Less than $25,000	–	–	–	–	–
$25,000–$49,999	−0.027 (0.059)	0.092 (0.057)*	−0.069 (0.101)	0.017 (0.041)	−0.055 (0.074)
$50,000–$74,999	−0.102 (0.083)	0.109 (0.068)	−0.046 (0.141)	−0.058 (0.057)	−0.133 (0.099)
$75,000+	−0.152 (0.098)	0.098 (0.070)	0.042 (0.173)	0.059 (0.067)	−0.068 (0.085)
Constant	0.786 (0.147)**	0.123 (0.193)	0.293 (0.254)	0.264 (0.080)***	0.223 (0.313)
R-squared	0.0621	0.0502	0.1366	0.0242	0.0426

Note: Dependent variable is the likelihood of treatment among survey respondents. Reported are estimated parameters with robust standard errors in parentheses.

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table A6 Characteristics of survey respondents

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Survey respondents	467	675	176	825	336
Male	0.533	0.610	0.602	0.525	0.479
Female	0.467	0.390	0.398	0.475	0.521
White	0.437	0.804	0.091	0.608	0.512
Nonwhite	0.563	0.196	0.909	0.392	0.488
Married	0.356	0.547	0.460	0.535	0.476
Disabled	0.066	0.074	0.119	0.065	0.036
18–25 years old	0.028	0.016	0.017	0.022	–
25–34 years old	0.197	0.142	0.148	0.141	–
35–44 years old	0.293	0.326	0.324	0.250	–

(*continued*)

Table A6 Continued

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
45–54 years old	0.362	0.375	0.381	0.322	0.503
55+ years old	0.120	0.141	0.131	0.265	0.497
No high school diploma	0.041	0.016	0.063	0.072	0.010
High school diploma	0.276	0.164	0.284	0.377	0.083
Some college	0.370	0.333	0.318	0.267	0.283
College degree	0.313	0.486	0.335	0.284	0.625
Self-employment experience	0.238	0.270	0.318	0.322	0.435
Family business	0.668	0.787	0.756	0.481	–
Relevant work experience	0.792	0.827	0.807	0.388	0.893
Business plan	0.214	0.169	0.176	0.127	0.051
Bad/no credit history	0.548	0.292	0.386	0.512	0.199
Family financial support	0.409	0.495	0.489	0.538	0.554
Household income					
Less than $25,000	0.411	0.215	0.364	0.449	0.310
$25,000–$49,999	0.347	0.323	0.381	0.326	0.289
$50,000–$74,999	0.137	0.216	0.165	0.136	0.137
$75,000+	0.105	0.246	0.091	0.090	0.265

Note: Reported are sample proportions.

Table A7 Number of completed counseling sessions and workshops

	Number of counseling sessions	**Number of workshops**
Project GATE		
Pennsylvania		
Treatment	1.2 (2.0)	4.8 (5.6)
Control	.3 (1.0)	1.1 (2.7)
Minnesota		
Treatment	1.5 (2.1)	4.9 (5.0)
Control	.6 (2.1)	1.9 (3.5)
Maine		
Treatment	1.4 (1.7)	2.9 (4.4)
Control	1.0 (1.7)	2.5 (4.1)
GATE II		
North Carolina		
Treatment	2.1 (3.3)	3.5 (4.8)
Control	.5 (1.7)	1.8 (3.8)
Virginia		
Treatment	3.0 (1.3)	5.4 (5.6)
Control	0.4 (1.3)	2.0 (3.8)

Note: Reported are sample means with standard deviations in parentheses.

Table A8 Distribution of counseling sessions and workshops, Project GATE

	Pennsylvania		Minnesota		Maine	
	Treatment	**Control**	**Treatment**	**Control**	**Treatment**	**Control**
Number of individuals	241	226	356	319	79	97
Counseling sessions						
0 sessions	0.578	0.898	0.388	0.793	0.367	0.577
1–2 sessions	0.220	0.053	0.419	0.116	0.443	0.268
3+ sessions	0.203	0.049	0.194	0.091	0.190	0.155
Workshops						
0 workshops	0.324	0.708	0.287	0.599	0.443	0.546
1–3 workshops	0.220	0.186	0.216	0.241	0.317	0.237
4+ workshops	0.456	0.106	0.497	0.160	0.241	0.217
Counseling, Workshops						
No sessions, no workshops	0.241	0.673	0.126	0.533	0.152	0.412
No sessions, 1–3 workshops	0.137	0.155	0.081	0.172	0.152	0.082
No sessions, 4+ workshops	0.199	0.071	0.180	0.088	0.063	0.082
1–2 sessions, no workshops	0.062	0.013	0.112	0.044	0.241	0.082
1–2 sessions 1–3 workshops	0.066	0.022	0.104	0.047	0.101	0.082
1–2 sessions 4+ workshops	0.091	0.018	0.202	0.025	0.101	0.103
3+ sessions, no workshops	0.021	0.022	0.048	0.022	0.051	0.052
3+ sessions, 1–3 workshops	0.017	0.009	0.031	0.022	0.063	0.072
3+ sessions, 4+ workshops	0.166	0.018	0.115	0.047	0.076	0.031

Note: Reported are sample proportions.

Table A9 Distribution of counseling sessions and workshops, GATE II

	North Carolina		Virginia	
	Treatment	**Control**	**Treatment**	**Control**
Number of individuals	629	196	178	158
Counseling sessions				
0 sessions	0.569	0.852	0.354	0.886
1–2 sessions	0.129	0.066	0.185	0.076
3+ sessions	0.302	0.082	0.461	0.038
Workshops				
0 workshops	0.461	0.638	0.320	0.627
1–3 workshops	0.191	0.219	0.174	0.196
4+ workshops	0.348	0.143	0.506	0.177
Counseling, Workshops				
No sessions, no workshops	0.355	0.592	0.219	0.589
No sessions, 1–3 workshops	0.045	0.020	0.039	0.019
No sessions, 4+ workshops	0.062	0.026	0.062	0.019
1–2 sessions, no workshops	0.094	0.168	0.045	0.177
1–2 sessions 1–3 workshops	0.038	0.031	0.062	0.019
1–2 sessions 4+ workshops	0.059	0.020	0.067	0.000
3+ sessions, no workshops	0.121	0.092	0.090	0.120
3+ sessions, 1–3 workshops	0.046	0.015	0.084	0.038
3+ sessions, 4+ workshops	0.181	0.036	0.331	0.019

Note: Reported are sample proportions.

Table A10 Intent-to-Treat (ITT) effects on employment and earnings

	Project GATE			GATE II	
	Pennsylvania	**Minnesota**	**Maine**	**North Carolina**	**Virginia**
Self-employment					
in own business	0.028 (0.037)	0.102 (0.035)***	0.071 (0.069)	0.040 (0.030)	0.008 (0.037)
as contractor	0.046 (0.027)*	−0.026 (0.027)	−0.108 (0.053)**	0.026 (0.026)	0.036 (0.041)
any self-employment	0.073 (0.042)*	0.077 (0.038)**	−0.038 (0.077)	0.066 (0.036)*	0.044 (0.048)
Regular employment	−0.040 (0.047)	−0.050 (0.038)	0.134 (0.081)*	−0.055 (0.040)	−0.062 (0.055)
Any employment	0.033 (0.040)	0.027 (0.030)	0.096 (0.068)	0.011 (0.037)	−0.018 (0.047)
Self-employment earnings	4 (49)	47 (99)	252 (171)	62 (55)	-94 (69)
Regular earnings	98 (223)	-314 (311)	852 (404)**	37 (124)	-666 (504)
Total earnings	102 (224)	-268 (311)	1,112 (402)***	99 (132)	-760 (508)
Has employees	−0.002 (0.023)	−0.004 (0.021)	0.116 (0.050)**	0.013 (0.014)	−0.009 (0.016)
Number of employees	0.03 (0.09)	0.08 (0.10)	0.21 (0.21)	0.10 (0.08)	−0.025 (0.028)

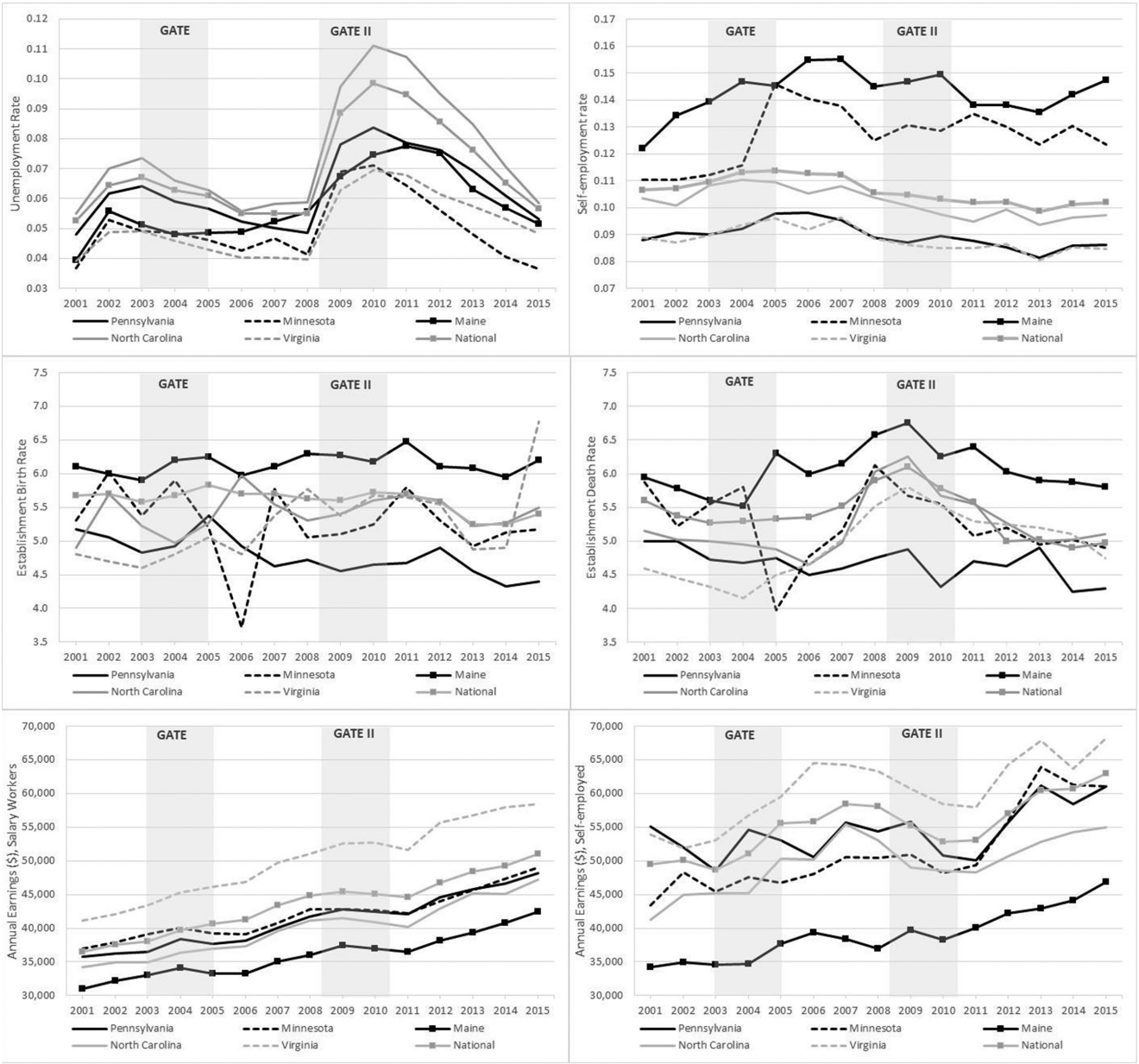
Note: Reported are estimated ITT effects with robust standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table A11 Correlations of key characteristics, treatment cases

Project GATE	**Self-employment experience**	**Good credit**	**College degree**	**45+ years old**
Pennsylvania				
Good credit	−0.0201	–	–	–
College degree	0.0173	0.1238	–	–
45+ years old	0.2167	0.2365	0.0476	–
Minnesota				
Good credit	−0.0483	–	–	–
College degree	−0.0077	0.0916	–	–
45+ years old	0.1942	0.0124	−0.0023	–
Maine				
Good credit	0.0042	–	–	–
College degree	0.0711	0.0261	–	–
45+ years old	0.2518	0.3044	0.1541	–
GATE II	**Self-employment experience**	**Good Credit**	**College Degree**	**45+ years old**
North Carolina				
Good credit	0.0119	–	–	–
College degree	0.0379	0.1794	–	–
45+ years old	0.1440	0.1524	0.0360	–
Virginia				
Good credit	−0.0328	–	–	–
College degree	0.0521	0.0355	–	–

Note: Reported are sample correlations for treatment group cases.

Figure A1 Context of Program Operation. *Note:* The top left figure reports the average annual unemployment rate.



(*Source*: Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics, https://data.bls.gov/PDQWeb/la). The top right figure reports the self-employment rate (*Source*: Authors' tabulations of the American Community Survey, https://usa.ipums.org/usa/). The middle left figure reports the number of new establishments as a percentage of the total number of establishments (*Source*: Business Employment Dynamics, U.S. Bureau of Labor Statistics, https://data.bls.gov/cgi-bin/dsrv?bd). The middle right figure reports the number of establishments that closed as a percentage of the total number of establishments (*Source*: Business Employment Dynamics, U.S. Bureau of Labor Statistics, https://data.bls.gov/cgi-bin/dsrv?bd). The bottom right and bottom left figures report the average annual pay per employee for salary workers and self-employed workers, respectively (*Source*: Authors' tabulations of the American Community Survey, https://usa.ipums.org/usa/). All data retrieved on July 12, 2018.