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# Entrepreneurship Training and Self-Employment among University Graduates

Evidence from a Randomized Trial In Tunisia

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## Abstract

In economies characterized by low labor demand and high rates of youth unemployment, entrepreneurship training has the potential to enable youth to gain skills and create their own jobs. This paper presents experimental evidence on a new entrepreneurship track that provides business training and personalized coaching to university students in Tunisia. Undergraduates in the final year of *licence appliquée* were given the opportunity to graduate with a business plan instead of following the standard curriculum. This paper relies on randomized assignment of the entrepreneurship track to identify impacts on labor market outcomes one year after

graduation. The analysis finds that the entrepreneurship track was effective in increasing self-employment among applicants, but that the effects are small in absolute terms. In addition, the employment rate among participants remains unchanged, pointing to a partial substitution from wage employment to self-employment. The evidence shows that the program fostered business skills, expanded networks, and affected a range of behavioral skills. Participation in the entrepreneurship track also heightened graduates' optimism toward the future shortly after the Tunisian revolution.

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# **Entrepreneurship training and self-employment among university graduates: Evidence from a randomized trial in Tunisia<sup>1</sup>**

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*Sector Board:* Social Protection

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## **1. Introduction**

Youth employment is at the center of the policy agenda around the world. The 2013 World Development Report emphasizes that employment not only matters for individuals' welfare, but also for social cohesion (World Bank, 2012a). The Arab Spring highlighted the dramatic consequences of high youth unemployment in countries such as Egypt or Tunisia. Throughout most of the Middle East and North Africa, youth unemployment rates are particularly high among university graduates, and policymakers often look for innovative and effective policies to facilitate the transition of youth from education to work (World Bank, 2012b).

In economies characterized by constrained labor demand from the private sector and high rates of youth unemployment, entrepreneurship-support interventions targeting students are promising policy options. Entrepreneurship training has the potential to enable graduates to gain skills and create their own jobs, as well as possibly also better align their skills with private employers' needs. Some OECD countries are providing entrepreneurship education to university students (Oosterbeek et al., 2008). Yet despite the potential of entrepreneurship training, evidence on how such programs shape students' skills and facilitate entry into self-employment remains thin.

Tunisia has long experienced high unemployment, particularly among new university graduates. For instance, 46 percent of graduates of the 2004 class were still unemployed eighteen months after graduation (MFPE and World Bank, 2009). Recent data show that graduates' unemployment has been rising. Based on the Tunisian Labor Force Survey, unemployment among youth holding a university degree increased from 34 percent in 2005 to 56 percent in 2011. In this context, Tunisia has attempted various reforms aiming to promote employability or self-employment among university graduates. This paper presents results from a randomized control trial evaluating a unique reform: the introduction of an innovative entrepreneurship track in the university curriculum.

In 2009, Tunisia mainstreamed a new entrepreneurship track into the applied undergraduate (*licence appliquée*) curriculum. Students enrolled in the last year of their *licence appliquée* were invited to apply to the entrepreneurship track, which entailed business training as well as

personalized coaching sessions.<sup>2</sup> Students could then graduate by writing a business plan instead of a traditional undergraduate thesis. Upon graduation, participants were invited to submit their business plans to a competition (*concours des meilleurs plan d'affaires "entreprendre et gagner"*). The fifty winners of the competition became eligible to receive seed capital to establish their business.

In this paper, we identify the impact of the entrepreneurship track on beneficiaries' labor market outcomes by relying on randomized assignment. Half of the 1,702 students who applied to the program in 2009/10 were randomly selected to participate in the entrepreneurship track while the other half were assigned to the standard curriculum. Students graduated in June 2010 and were re-interviewed between April and June 2011. We show that the entrepreneurship track significantly increased the rate of self-employment among university graduates approximately one year after graduation, but that the effects are small in absolute terms, ranging from 1 to 4 percentage points. Given the low prevalence of self-employment in the control group, these small absolute effects imply that program participants were on average 46 to 87 percent more likely to be self-employed compared with graduates from the control group.<sup>3</sup> However, the employment rate among beneficiaries remained unchanged, which in partial equilibrium points to a substitution from wage employment to self-employment. The evidence suggests that the program affected employment outcomes through a range of channels. In particular, it fostered business skills, expanded networks, and shaped behavioral skills. Participation in the entrepreneurship track also heightened graduates' sense of opportunities and optimism towards the future shortly after the Tunisian revolution.

To our knowledge, the analysis of the Tunisian entrepreneurship track provides the first experimental evidence on the effectiveness of entrepreneurship education targeted to university students<sup>4</sup>, as well as the first evidence on entrepreneurship-support interventions in the Middle East and North Africa (Angel-Urdinola et al., 2010). Furthermore, we analyze the effectiveness

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<sup>2</sup> The program was implemented in all Tunisian universities delivering *licences appliquées*, including Ez-Zitouna, Jendouba, Gabès, Gafsa, Tunis, Kairouan, Mannouba, Monastir, Carthage, Sfax, Sousse, Tunis, and Tunis El-Manar.

<sup>3</sup> As we will discuss below, the rate of self-employment in the control group is 4%. This is in line with the low rate of self-employment among university-educated in Tunisia in general. Among 25 – 34 year old with a university degree, 4.6 percent were classified as independent workers and 5.6 percent as employers according to the Labor Force Survey of 2010.

<sup>4</sup> Oosterbeek et al. (2008) analyze the impact of entrepreneurship education on students' entrepreneurship competencies and intentions in the Netherlands. They find few positive effects, but their study used a quasi-experimental approach with a small sample size and high attrition rates.

of the training not only in facilitating entry self-employment, but also in shaping a range of behavioral skills.

As such, this paper contributes to different strands of the literature. For instance, it relates to studies analyzing the effectiveness of skills training programs to foster employability and productivity among youth in developing countries. Most of the existing evidence comes for Latin American programs and tends to focus on vocational training for at-risk youth (Ibararran and Rosas, 2008). Furthermore, few papers rely on experimental methods in developing country settings (see Almeida et al., 2011a, Angel-Urdinola et al., 2010, Betcherman et al., 2004, 2007, and Kluge et al., 2010 for recent reviews). Attanasio et al. (2011) study the *Jóvenes en Acción* program in Colombia. They find that vocational training programs significantly increased the probability of employment for women and increased the level of income for both men and women. In particular, women earned about 18 percent more than they would have without the program and men earned 8 percent more. Most of the effects are driven by the on-the-job training component, with classroom training playing a much smaller role in promoting employability. Card et al. (2011) study the effectiveness of a youth employment program in the Dominican Republic. They do not find any significant effects on employment, but find positive effects at the margin on labor earnings shortly after the program finished. Recent studies have assessed the effectiveness of programs aiming to shape soft skills, which may be particularly malleable among youth (Almlund et al., 2012). For instance, Groh et al. (2012) present evidence from Jordan on the effectiveness of wage subsidies and soft skills training in helping female community college graduate find employment. They show that wage subsidies are effective in increasing employment in the short-term, but that a soft skills training program has no average impact on employment. Our paper complements these studies but is unique in using a randomized approach to analyze the impact of providing entrepreneurship training to young university students and focus on their decision to enter self-employment.

This paper also relates to studies analyzing the effectiveness of entrepreneurship-support interventions in developing countries. Entrepreneurship is a key building block of productivity growth (Baumol, 1968), and a large share of the labor force in most developing countries is self-employed (Gollin, 2002; Banerjee and Duflo, 2008). Evaluations of entrepreneurship-support interventions such as business training and grants have shown that they can be effective in

fostering self-employment and earnings. However, most of the evidence to date has focused on either existing business or on individuals that are low skilled (McKenzie and Woodruff, 2012). In contrast, our paper is to our knowledge the first study focusing on youths' transition from education to work, and entry into self-employment. Previous studies often focus on the activation of low productivity workers, the inactive, or the unemployed. For example, Almeida and Galasso (2010) or De Mel et al. (2010) analyze the effects of business training on a sample of potential business owners, while Klinger and Schündeln (2011) study entrepreneurs with existing businesses of about ten employees on average. In Argentina, the *Microemprendimientos Productivos* project provides financial support in the form of in-kind grants to finance inputs and equipment with the aim of jumpstarting self-employment and reducing dependence on welfare payments. Almeida and Galasso (2010) show that combining entrepreneurship support and micro grants was effective in increasing self-employment, particularly for women with related labor market experience. In Sri Lanka, De Mel et al. (2012) find that the ILO "Start and Improve your business" training program sped up the process of opening a business among women who were interested in starting enterprises. In addition, they also find improved profitability and better practices in these new businesses. When the training was targeted to women already in business, they find more limited changes in business practices but no impacts on profitability. Klinger and Schündeln (2011) study the effect of entrepreneurship training provided by an NGO on firm outcomes in Central America. Using a discontinuity design, they find that receiving business training significantly increased the probability that training participants would start a business or expand an existing business. The program seemed to be more effective among women when they also won a monetary prize. A set of studies looks at the effectiveness of business training targeted to micro finance clients. Karlan and Valdivia (2011) study the impact of training provided by FINCA in Peru, a program targeted at improving business practices. Results show that the program was not associated with significant increases in sales, profits, or employment. Drexler et al. (2010) compare two training programs on mostly female micro finance clients in the Dominican Republic. They show that a small training program may have improved business practices and sales in bad weeks, but did not have a significant impact on average sales. Bruhn and Zia (2011) randomized the business training provided by a local NGO - the Entrepreneurship Development Center (EDC) - for its microfinance clients in Bosnia-Herzegovina. They find

some improvements in business practices, but no increases in business profits or in business survival rates.

Finally, a number of recent papers attempt to profile successful entrepreneurs in terms of preferences or behavioral skills (Elston et al., 2005, Djankov et al., 2006; de Mel et al., 2010). Unlike our paper, only a few studies have provided evidence on employment programs that shape these behavioral skills or attitudes. Carneiro et al. (2010) show that that participants in *Chile Solidario* have greater self-esteem and higher perceived self-efficacy in the labor market as well as greater optimism towards the future.<sup>5</sup> In Jordan, Groh et al. (2012) find that a soft skills training course improved female graduates' mental health and positive thinking. Blattman et al. (2011) show that in Northern Uganda, the NUSAF Youth Opportunities Program that provides cash grants for investments in seed capital or vocational training had some limited effects on dimensions of social cohesion. Likewise, Blattman and Annan (2011) show that reintegration and agricultural livelihoods program for high-risk Liberian youth have positive impacts on social inclusion, through improvements in social engagement, citizenship and stability. In this paper, we measure how the entrepreneurship training program affected individual's behavioral skills and their attitudes towards the future.

The rest of the paper is organized as follows. Section 2 briefly sets the country context and describes the entrepreneurship track. Section 3 describes the randomized assignment and take-up of the entrepreneurship track. Section 4 describes the empirical strategy. Section 5 discusses the main effects of the program on labor market outcomes, while Section 6 discusses some of the main channels behind these impacts. Section 7 concludes.

## **2. The Tunisian entrepreneurship track: Business training and coaching**

In Tunisia, both the graduation rate from university and the unemployment rate among tertiary educated youth have been increasing steadily. Access to post-secondary education has soared over the past decade. Gross enrollment rates in tertiary education reached 34 percent in 2009, up from 12 percent in 1995 (EduStats, 2011). At the same time, unemployment rates among youth with a higher education degree have reached alarming levels. According to data from the

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<sup>5</sup> An ongoing World Bank evaluation of the youth training program *Juventud y Empleo*, a comprehensive training program in the Dominican Republic shows similar results: preliminary evidence shows significant effects on future expectations, job satisfaction, and job search attitudes.



Tunisian Labor Force Survey, unemployment among youth (aged 29 or below) holding a university degree increased from 34 percent in 2005 to 56 percent in 2011. These figures are suggestive of a long education-to-work transition for university graduates. University graduates constitute a large share of unemployed youth in Tunisia. While tertiary educated youth (15-29 years old) made up less than 16 percent of those employed in the Tunisian labor market in 2010, they accounted for over 34 percent of the unemployed. In this context, the graduates' employment problem has become one of the main concerns for policymakers in Tunisia.

As part of a Development Policy Loan aiming to support a broad set of employment policies in Tunisia, an innovative entrepreneurship track was introduced into the tertiary curriculum in academic year 2009/10. Up to then, during the last semester of the applied undergraduate curriculum, students took an internship and wrote an academic thesis as graduation requirements. In June 2009, the Ministry of Education and Higher Education passed a reform creating an entrepreneurship track where students would receive business training and coaching to develop a business plan. In August 2009, the Ministries of Education and Higher Education and of Vocational Training and Labor jointly signed an order to allow students to graduate by submitting their business plan instead of a traditional thesis. The newly established entrepreneurship track aimed primarily at increasing self-employment and fostering an entrepreneurship culture among university graduates, as well as more broadly at improving participants' employment outcomes.

To increase students' awareness of the new track, communication campaigns took place on campus and through the media to inform students about the newly introduced alternative to the standard curriculum. Once in the entrepreneurship track, students were offered support for developing a business plan through business training and personalized coaching. The entrepreneurship track provided students with: (i) entrepreneurship courses organized by the public employment office; (ii) external private sector coaches, mainly entrepreneurs or professionals in an industry relevant to the student's business idea; and (iii) supervision from university professors in development and finalization of the business plan. For each student, the final product of the program was a comprehensive business plan that served as an undergraduate thesis. Participants were also given the option to submit their business plan to a competition, with a chance to win seed capital to fund their project.

Selected students participated in the program between February and June 2010, starting with intensive business training to develop, modify, or refine an initial business idea. Students took twenty days of full-time intensive training at local employment offices (*Agence Nationale d'Emploi et de Travail Indépendent*, ANETI) between February and March 2010. The training was called *Formation Création d'Entreprise et Formation des Entrepreneurs* (CEFE) and was already part of the active labor market menu offered by ANETI. The training was conducted in small groups and included practical research on the ground, aimed at fostering participants' behavioral skills, business skills and networking skills.

The first part of the training consisted of four modules: (a) for the person, aimed at developing an entrepreneurship culture and behavioral skills; (b) for the project, aimed at developing business ideas through brainstorming and followed by SWOT (strength, weaknesses, opportunities, and threat) analysis to isolate the best project idea for each participant; (c) for management, aimed at general management principles (including leadership, partnership choice, organization, time management, and planning tools); and (d) for marketing, aimed at identification of the relevant market and market research (competition, clients, technology standards, etc.) as input into cost analysis.

Following this initial part of the training program, participants had the opportunity to present their ideas and get feedback from bankers and experts. After project ideas were refined to reflect this feedback, students participated in three additional modules on information research, business plan and networks: (a) information research -- participants had three days to research facts pertaining to implementation of their projects on the ground; (b) business plan training -- participants were taught how to estimate key parameters, such as investments (inception costs and financing), revenues, and business expenses (purchases, personnel costs, imports, financing expenses, amortization, etc.); and (c) building networks -- at least five resource persons (business specialists) were invited to give talks.

Students were then assigned a personalized coach and received supervision from a university professor to develop the business plan. Coaches were private sector entrepreneurs or specialized coaches from ANETI or the Ministry of Industry's network of start-up offices (*Agence de Promotion de l'Industrie*, API). Students were expected to participate in eight coaching sessions,

either individually or in small groups. Coaching took place from April to June 2010. In parallel, students also received supervision from one of their university professors.

In June 2010, the business plans were completed and defended by students at their university as part of the graduation requirements. After the defense, program participants were eligible to submit their business plan to a national business plan thesis competition. The jury selected fifty winners who were eligible to receive seed capital for establishing the business outlined in their business plans. The first five winners were eligible for seed capital of 15,000 Dinars each (approximately US\$10,000), the next twenty winners, 7,000 Dinars; and the last twenty-five winners, 3,000 Dinars.

### **3. Randomized assignment and entrepreneurship track take-up**

In 2009/10, 18,682 students were enrolled in the third year of *licence appliquée* in Tunisian universities. All these students were invited to fill in an application form for the entrepreneurship track in November or December 2009. In total, 1,702 students (or 9.1 percent of all eligible students nationwide) applied to participate in the newly established entrepreneurship track. Of those, 1,310 students applied individually and 392 applied in pairs, so that in total, 1,506 projects were registered.

Table 1 shows the number of enrolled students and applicants by gender and university. The third column shows the distribution of the application rate. The last two columns present the distribution of all students enrolled in the third year of *licence appliquée* in 2009/10 and of applicants, by gender and respectively by university. Two-thirds of the applicants were women. While this is a high participation rate for women, the program did not especially attract women as they were equally represented in the overall population of *licence appliquée* students.

Demand for the program varied across universities. Four universities account for 66 percent of participants to the entrepreneurship track: Table 1 shows that the application rate to the program was particularly high at the universities of Gafsa (28.7 percent), Monastir (16.3 percent), Sfax (14.2 percent), and Jendouba (13.9 percent). By contrast, demand was relatively low among students from Tunis El Manaar (1.2 percent) and in Manouba (0.7 percent). Differences in application rates are likely explained by regional variations in the implementation of the

information campaigns and intensity of advertisement about the program<sup>6</sup>, as well as regional variations in youth unemployment and perceived employment opportunities.<sup>7</sup>

Baseline data for the impact evaluation are obtained from two sources. An application form was collected in November and December 2009. Additional information (particularly on individual entrepreneurship traits) was collected through a phone survey in January and February 2010.

The baseline survey suggests that the intervention responded to a strong demand from students and that applicants had high expectations for their participation in the program. 85 percent of applicants already had a project idea at the time of application. Students had various reasons for applying: 72 percent of applicants listed their willingness to realize one of their project ideas as the main reason; 56 percent of students indicated that they applied to have more flexibility; 30 percent to gain experience to find a job; 29 percent due to the lack of salaried jobs; and 12 percent because of family tradition. Applicants' expectations were high: 88 percent of applicants expected that the intervention would facilitate their insertion in the labor market, and 89 percent expected to have higher earnings thanks to the intervention.

The impact evaluation relies on randomized assignment among applicants to the entrepreneurship track to estimate the causal impact of the program. Given the oversubscription to the program, half of the applicants were randomly assigned to the entrepreneurship track and the other half were assigned to continue with the standard curriculum. Randomized assignment was conducted at the project level, stratified by gender and by the subject students were reading for (divided into fourteen groups<sup>8</sup>). 757 projects were assigned to the treatment group (658 individual projects, and 99 projects in pair). 742 projects were assigned to the comparison group (652 individual projects; 97 projects in pairs).

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<sup>6</sup> University professors played an instrumental role in informing students about the program. 84 percent of all applicants heard about the program through professors, 39 percent from posters, and 17 percent from other students, friends, and relatives.

<sup>7</sup> Application to the entrepreneurship track was particularly high in regions with the highest unemployment. For instance, Gafsa exhibited the highest youth unemployment rate (close to 50 percent) and also had the largest application rate to the entrepreneurship track (28.7 percent of all eligible students in *licence appliquée*). Similarly, Jendouba has the second highest unemployment rate (35 percent) and a participation rate to the entrepreneurship track of 13.9 percent.

<sup>8</sup> The fourteen groups of subjects were: Economics and Finance; Accounting; Business Administration; Marketing; Humanities; Languages; Science; Technical; Telecommunications; Civil Engineering; Informatics; Sports and Tourism; Food/Agriculture, and Other.

After the baseline data was collected and the randomization performed, students participated in the entrepreneurship track between February 2010 and June 2010, when they graduated. Follow-up data were collected through face-to-face interviews between April and June 2011, approximately nine to twelve months after the end of the academic year.<sup>9</sup> The instrument included questions related to socio-economic characteristics and a detailed labor module. The survey also collected a range of other indicators including information on aspirations for the future, personality traits, and behavioral skills related to entrepreneurship. Thorough tracking procedures led to low non-response rates at follow-up<sup>10</sup>: 92.8 percent of the 1,702 applicants were tracked, a low attrition rate given the high mobility of the population of graduates.<sup>11</sup> Importantly, attrition was balanced and uncorrelated with treatment status.<sup>12</sup>

Table 2 presents the average baseline characteristics of the treatment group (assigned to the entrepreneurship track) and the control group (assigned to the standard curriculum), as well as differences between the two at baseline.<sup>13</sup> Randomization achieved good balance. There were few systematic differences between participants and non-participants and the differences were quantitatively small.<sup>14</sup> Empirical analysis will control for the few characteristics that are statistically different between the two groups at baseline.

Administrative records from ANETI show imperfect compliance with assignment to the treatment group. Of the 856 students who applied and were randomly assigned to the entrepreneurship track, 67 percent completed the business training at the local employment office, and 59 percent completed both business training and coaching. Overall, 41 percent dropped out of the program prior to completing both training and coaching. The magnitude of

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<sup>9</sup> In October 2010, qualitative data were collected to gather students', coaches', and professors' perceptions on the implementation of the intervention.

<sup>10</sup> Detailed contact information was collected in the baseline surveys. This included students' address, email address, landline and cell phone numbers, as well as their parents' address, landline and cell phone numbers. Most students register at employment offices upon graduation, and contact information (phone numbers and address) from the employment office database was also collected and merged with the data (see World Bank and MFPE, 2012).

<sup>11</sup> The attrition rate is lower to the one achieved for other surveys in the country. For instance, the attrition rate for the 2005 Tunisia graduate tracer survey was 11 percent. Oostenbeck et al. (2008) have an attrition rate of 56 percent in their study of entrepreneurship education for university students in the Netherlands.

<sup>12</sup> Attrition in the full baseline sample was 7.2 percent at follow-up. At baseline, 10.1 percent of applicants could not be reached for the complementary phone survey conducted in January and February 2010. Combined attrition in either this baseline phone survey or the follow-up survey collected in 2011 is 15.9 percent. Attrition in both surveys was 1.4 percent. All of these attrition indicators were balanced across treatment and comparison groups.

<sup>13</sup> Table 2 is presented for the effective sample used for estimations and composed of the 1,580 students that could be tracked at follow-up. Results are almost identical when using the full baseline sample of 1,702 students.

<sup>14</sup> For example, participants seemed to be on average older and had more years of experience than non-participants.

these drop-out rates are consistent with other similar entrepreneurship training program analyzed in the literature, such as Groh et al. (2012) or de Mel, McKenzie and Woodruff (2012).

Anecdotal evidence from qualitative interviews with graduates, coaches, and professors points to a number of reasons for students dropping out of the entrepreneurship track, including some lack of information and implementation challenges. The program was being implemented for the first time, and in some universities, students were informed late or insufficiently of the modalities of their participation in the entrepreneurship track.<sup>15</sup> The quality of the training and coaching sessions also varied both by training location and by coach or facilitator.<sup>16</sup>

Table 3 presents marginal effects from the estimation of a logit model to describe the profile of students who complied with their assignment to the entrepreneurship track and completed it. Students who had a project idea at the time of application were more likely to comply with their assignment to the treatment group by completing the business training and personalized coaching sessions. In contrast, male students were more likely to drop out, and so were students in an Economics, Finance, or Business stream.<sup>17</sup> These students may have been more familiar with the entrepreneurship training content and as such may have perceived a relatively lower value-added of the entrepreneurship track compared to students from other subjects. Variations in drop-out rates across regions are also observed: compared to Tunis, compliance with treatment was lower in Sfax, but higher in Sousse, Monastir, Kairouan, Gafsa, and Jendouba, which are also the regions with relatively higher unemployment rates.

Administrative data reveal high compliance for students assigned to the control group. The twenty days of CEFE training was regularly provided by employment offices so that some control students may also have been able to take the training after graduating, although personalized coaching would not have been available to them. Administrative and survey data show that take-up of the CEFE training was low in the control group, with only twenty-nine students (or 3.4 percent of the control group) completing the CEFE training after graduation.

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<sup>15</sup> A student from Gabes, for example, reported that she was asked by the employment office to decide whether she wanted to remain in the traditional track or take up the entrepreneurship track before she fully understood what the latter entailed. As a result, she eventually decided to drop out of the entrepreneurship track.

<sup>16</sup> Given the high expectations at the onset of the program, some students were disappointed in the training and dropped out. Other students dropped out due to exams conflicting with the twenty days of training when attendance was mandatory.

<sup>17</sup> Data from a graduate tracer study in Tunisia suggest that graduates from Economics, Business, and Law were particularly prone to long unemployment spells after graduation (MFPE and World Bank, 2009).

## **4. Empirical identification strategy**

### 4.1 Hypotheses

The first and main hypothesis considered in this paper is whether the training and coaching delivered as part of entrepreneurship track increased self-employment among graduates. We test whether the entrepreneurship track was effective at promoting self-employment by using three indicators. The first indicator captures whether the respondent was self-employed at any point over the 12 months prior to the survey. The second indicator relies on a 7 day recall consistent with official definitions in Tunisia. The third indicator is more conservative as it uses a 7 day recall but excludes individuals self-employed in seasonal activities. Importantly, none of the self-employment indicators includes family workers.

As a second hypothesis, we test whether the entrepreneurship track increased overall employment among beneficiaries. On the one hand, skills acquired during the entrepreneurship training may be transferable across occupations. The entrepreneurship track can potentially equip graduates with skills valued by employers and as such increase students' probability of finding wage jobs. On the other hand, the assignment to the entrepreneurship track may induce a substitution away from wage employment. For instance, the program may negatively affect the probability that participants find wage jobs in the private sector, either because it equips students with the wrong types of skills for wage employment or because the standard curriculum may be more valuable to find wage jobs since it includes writing an academic thesis and undertaking an internship. To shed light on these potential mechanisms, we estimate the impact of the entrepreneurship track on overall employment as well as its two main components, self-employment (as above) and wage employment. We also measure the impact of the interventions on other variables capturing employment status (unemployed, studying, inactive). All these indicators are based on a 7 day recall period, consistent with official definitions in Tunisia. Finally, we estimate the impact of the intervention on some characteristics of employment, including hours worked, earnings, and self-reported reservation wage for public and private sector wage employment, as well as social security coverage.

Third, we analyze a series of mechanisms through which the intervention can potentially affect employment outcomes. These different channels relate to the content of the business training

described in section 2. The training aims to provide participants with business skills, technical knowledge and experience directly useful to produce a business plan. It connects beneficiaries to a wider social network, including entrepreneurs and bankers. In parallel, a component of the training curriculum aims to shape students' behavioral skills and personality. Finally, the entrepreneurship training improves participants' access to information about credit. Participants in the entrepreneurship track also have the possibility of obtaining a financial prize if they enter and win the business plan competition. Therefore, we estimate the impact of the intervention on intermediary outcomes related to business skills, networks, behavioral skills, and access to credit with the objective of teasing out the channels through which the entrepreneurship track affected employment outcomes.

For each set of outcome and intermediary outcome variables, we present both intent-to-treat (ITT) and treatment-on-the-treated (TOT) estimates. Results are highly consistent across the two sets of estimates. ITT estimates constitute our preferred set of estimates since they capture the impact of *offering* business training and coaching independently of actual take-up.

#### 4.2 Intention to treat (ITT)

Identification of program impacts relies on the randomized assignment of applicants to the entrepreneurship tracks to treatment and control groups. We first present intent-to-treat (ITT) estimates, obtained by comparing average outcomes for the treatment and comparison groups at follow-up. ITT estimates capture the impact of *offering* business training and coaching independently of actual take-up. To obtain ITT estimates, we estimate the following empirical model using Ordinary Least Squares (OLS):

$$Y_i = \beta T_i + \gamma X_i + \pi_{is} + \varepsilon_i \quad (1)$$

where  $Y_i$  is the outcome of interest for student  $i$  at follow-up,  $T_i$  is a binary variable for being randomly assigned to the treatment group,  $X_i$  is a set of control variables,  $\pi_{is}$  are fixed effects for each randomization strata (by gender and the fourteen subject groups) and  $\varepsilon_i$  is a mean-zero error term.<sup>18</sup>

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<sup>18</sup> We include a binary variable for each randomization strata to increase power (Bruhn and McKenzie, 2009).



We present results for three specifications. In specification I,  $X_{1i}$  includes a constant and a set of control variables from the baseline application form, including age at first job, previous experience in self-employment, prior experience with projects, prior experience in helping an entrepreneur, and mother's employment status. Standard errors are clustered by strata (university and gender). In specification II,  $X_i$  contains a constant and an expanded set of controls ( $X_{2i}$ ) including those from the baseline application form as well as additional variables from the baseline phone survey capturing behavioral skills (patience, willingness to take risk, impulsiveness, tenacity, and sense of achievement). This expanded set of controls reduces the effective sample size to 1,432 due to combined attrition in the baseline phone survey and the follow-up survey. Standard errors are again clustered by strata. Finally, results from specification III are obtained by using the same set of control variables as for specification I ( $X_{1i}$ ) and standard errors clustered by the governorate where students live at baseline.

#### 4.3 Treatment on the treated (TOT)

In addition to ITT estimates, we also present and briefly discuss treatment on the treated (TOT) estimates. TOT estimates capture the impact of the entrepreneurship track for the students who complied with their assignment to the treatment or control group. The last section has documented that not all students assigned to the treatment group remained in the program (and a few control students took up the training component of the entrepreneurship track). TOT estimates account for this noncompliance and isolate the impact of actually receiving the intervention for students who complied with their original assignment to the treatment or control group. In the empirical analysis, compliance for students in the treatment group is defined as *completing the business training and receiving coaching*<sup>19</sup>. TOT estimates are derived for a range of outcomes of interest by instrumenting actual completion of the entrepreneurship track with the randomized assignment to the entrepreneurship track.

The first stage isolates the effect of being randomly assigned to the entrepreneurship track on completing the entrepreneurship training and receiving coaching. The impact of the treatment on the likelihood of completing entrepreneurship training and attending coaching sessions can be estimated via OLS regression for the following equation:

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<sup>19</sup> Results are very similar when compliance is defined as *completing the business training* only and are not presented here.

$$U_i = \beta T_i + \gamma X_i + \pi_{is} + \varepsilon_i \quad (2)$$

where  $U_i$  is the information (from administrative records) on whether student  $i$  completed entrepreneurship trainings and received coaching during academic year 2009/2010,  $T_i$  is an indicator variable for randomized assignment to the treatment group,  $X_i$  is a vector of controls,  $\pi_{is}$  are strata fixed-effects, and  $\varepsilon_i$  is a mean-zero error term. The coefficient  $\beta$  indicates the causal effect of being selected for the entrepreneurship track via lottery on the likelihood of actually completing the entrepreneurship track.

In a second stage, the effect of increased take-up of *business training and coaching sessions* on employment (and other) outcomes is estimated. Randomized assignment to the entrepreneurship track generates a large and exogenous increase in program take-up in the treatment group. The exogenous variation in take-up predicted in the first stage (equation (2)) can be used to estimate the TOT estimates per the following equation:

$$Y_i = \theta \hat{U}_i + \xi X_i + \pi_{is} + \varepsilon_i \quad (3)$$

where  $Y_i$  is the outcome of interest at follow-up of individual  $i$  and  $\hat{U}_i$  is the predicted program take-up from the first stage. The coefficient  $\theta$  gives the TOT, which is the impact of actually taking up entrepreneurship training or coaching *for students who complied with their assignment to the treatment or control group*.

TOT estimates are local average treatment effects and should be interpreted as such. They are estimated for students who complied with their assignment to the treatment group and actually took up the program because they were selected to participate. The previous section showed the characteristics of the compliers and revealed that students who dropped out had some different characteristics. Very few students in the control group took the entrepreneurship training after graduation. In this sense, TOT estimates essentially produce the average impact of the program for students who had the characteristics of compliers.

Importantly, almost all the results below are robust across ITT and TOT estimates, with TOT estimates of larger magnitude as would be expected. Given the consistency of the results across both sets of estimates, we mainly focus on discussing ITT estimates since they are more easily interpreted and directly policy-relevant.

## **5. Results: Labor market outcomes**

This section presents program impacts on the main labor market outcomes by estimating equation (1) with OLS and equation (3) with two-stage least squares. The main findings are reported in Table 4 for a series of labor market outcomes including self-employment (Panel A), employment status (Panel B), and proxies for employment characteristics such as whether the individual has a contract, is covered by social security, labor earnings or the number of hours worked (Panel C). In Table 4, the first column reports the number of observations; the second and third columns report the sample means for the dependent variable in the control and treatment groups. The next 4 columns present results from specification I followed by specifications II and III. ITT estimates are in columns (1), (3) and (5), TOT estimates in columns (2), (4) and (6).

### **5.1 Impacts on self-employment**

Estimates show that the intervention increased self-employment among program participants approximately one year after graduation. The positive impact of the entrepreneurship track on graduates' self-employment holds across a range of indicators, such as whether the individual reported having been self-employed in any activity over the last year, whether he/she was self-employed in any activity last week, or whether he/she was self-employed in permanent activities last week. All indicators exclude family workers. Focusing on self-employment in any activity in the last 7 days (the official definition of self-employment in Tunisia), the ITT estimate shows a 3 percentage point increase in the probability of being self-employed. For those students who actually completed the program (training completion and coaching), the TOT estimate reveals a 5 percentage point increase in the likelihood of being self-employed in any activity in the last week.

While increases in self-employment are robust across specifications and indicators, the estimated effects are small in absolute terms, ranging for 1 to 4 percentage points for ITT estimates. Since the rate of self-employment is low in the control group to start with, even these small absolute impacts lead to relatively large effect sizes. Indeed, the average self-employment rate in the control group is 4.4 percent. Therefore, a 3 percentage point increase in self-employment in any activity over the last week is equivalent to a 68 percent increase over the self-employment rate in

the control group. The average effect sizes for program impacts on self-employment are displayed in Panel D of Table 4. Average effect sizes range from 46 to 87 percent depending on the specification and self-employment indicator.

## 5.2 Impacts on employment status

Table 4 (Panel B) makes clear that young university graduates are particularly vulnerable to the lack of salaried jobs. Only 28 percent of students in the control group were employed one year after graduation, contrasting with 48 percent being unemployed.<sup>20</sup>

While the program had impacts on self-employment, we find no evidence that the program significantly affected overall employment as captured by the likelihood of being employed in the last 7 days. In fact, estimates are negative and point to a reduction in the probability that program beneficiaries hold salaried employment. Even though the effect is not significant, the decrease in wage employment is of the same magnitude as the increase in self-employment. Similar to findings in Fairlie et al. (2012) in the US, these results suggest that the program changed the composition of employment by inducing a substitution from wage employment to self-employment for participants in the entrepreneurship track.

Importantly, the substitution from wage to self-employment is a partial equilibrium effect, and does not take into account potential general equilibrium effects. Indeed, the shift from wage employment into self-employment may free up job opportunities for non-participants, therefore potentially leading to higher employment overall in general equilibrium. The impact evaluation design would not allow identifying such general equilibrium effects.

Overall, while the program increased graduates' self-employment in a context where the supply of jobs is limited, the results show that the entrepreneurship track did not promote graduates' chances of finding a salaried job nor did it seem to have any impact on beneficiaries' probability of being employed in any activity one year after graduation. On the one hand, this is explained by the fact that the entrepreneurship track is only effective in increasing self-employment for a limited (although significant) number of students. On the other hand, the evidence does not

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<sup>20</sup> These results are comparable with data from a tracer survey of university graduates from the class of 2004, which found that 46 percent of graduates were still unemployed 18 months after graduation (MFPE and World Bank, 2009).

support the hypothesis that the entrepreneurship track would also better align students' skills with employers' needs and improve their prospect of finding wage jobs. On the contrary, the results suggest trade-offs between policies that aim to promote self-employment and policies that aim to facilitate the transition from education to wage jobs.

### 5.3 Impacts on employment characteristics

Table 4 (Panel C) presents the impacts of the entrepreneurship track on employment characteristics, including hours worked, earnings, having a contract, being covered by social security, working in a large firm, and reservation wages. The variables capturing the characteristics of employment (including earnings) contain zeros for those individuals not working. Two important outcomes considered in the analysis are whether the worker is employed in a job with social security coverage and whether he/she has a written contract. These variables are binary; i.e., they take a value of one if an individual is employed with social security coverage or has a written contract and zero if he/she is not working at all or works without coverage or without a written contract. This distinction allow us to shed some light on the program's potential effect on entry into higher-end, formal sector jobs.

The results show that the entrepreneurship track did not promote higher quality jobs among participants. In particular, there were no significant program impacts on employment in the formal sector, firm size, hours of work, or earnings. These results are consistent with the findings that overall employment remained unchanged.<sup>21</sup>

The results show weak but consistent evidence that the program increased students' reservation wage for private sector jobs (i.e. the minimum wage at which an individuals would accept a job offer), but did not affect their reservation wage for public sector jobs. Studies have shown that the earnings and security provided by public sector jobs are highly valued by youth, a factor that contributes to high unemployment and inactivity rates in Tunisia (World Bank, 2012b). As such, finding higher reservation wage for private jobs is consistent with the program leading to greater valuation of self-employment or entrepreneurial activities in general. This result can contribute

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<sup>21</sup> Conditional on being wage-employed, i.e., only looking at employed individuals, the results suggest that program beneficiaries hold slightly better quality jobs, as they were more likely to have full-time contracts, and less likely to be supported by a wage-subsidy (*stages d'Initiation à la Vie Professionnelle* "SIVP"), but more likely to hold term contracts (*contrats à durée déterminée* "CDD").

to explain the partial substitution from wage to self-employment documented above. It also suggests that self-employment is a substitute for private sector jobs but not with public sector jobs.<sup>22</sup>

## **6. Channels of impact**

The previous section documented that the program increased self-employment among participants, and suggested a partial substitution from wage employment to self-employment. This section attempts to tease out the channels through which the program affected employment outcomes. This is done by presenting impacts on intermediary outcomes such as: (i) business skills; (ii) networks; (iii) preference and behavioral skills; (iv) attitudes towards the future; and (v) access to credit. Tables 5, 6 and 7 display results for these channels and the same specifications as in Table 4.

### **6.1 Business skills**

Table 5 (Panel A) presents evidence that the intervention produced strong impacts on participants' self-reported business skills. A major objective of the entrepreneurship track was to equip students with technical knowledge on how to produce a business plan and practical experience in developing a project.

Results show that beneficiaries report having more practical experience in realizing projects – the average ITT was a 10 percentage point increase in practical experience, a 27 percent increase over the control group. Program graduates also have significantly better knowledge about topics taught in the entrepreneurship track, including in being able to list the components of a business plan (for instance a supply assessment or a marketing plan). For example, 77 percent of program graduates reported knowing how to produce a business plan, compared to 45 percent in the control group. These impacts are closely related to the core content of the business training offered by the national employment office and as such were expected. They do suggest that not all students assigned to the entrepreneurship track fully acquired the technical knowledge that was taught, consistent with the dropout patterns documented above.

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<sup>22</sup> Consistent with a higher reservation wage for private sector jobs, individuals in the treatment group are more likely to reject a job offer because the salary is too low.

## 6.2 Networks

Table 5 (Panel B) reports program impacts on a number of networking proxies, including whether the beneficiaries registered at employment offices, whether they knew an entrepreneur, an employment officer or a banker, and how often he/she interacted with him. Results show that the entrepreneurship training was effective in increasing the business and employment networks of participants. Participants are marginally more likely to be registered at employment offices, an indicator obtained directly from administrative data, not from the follow-up survey. Graduates that were assigned to the entrepreneurship track are also more likely to know an employment agent, even though they do not interact with the employment agent more frequently than graduates from the control group. Furthermore, there is evidence that the program increased the probability of knowing an entrepreneur, as well as knowing and interacting frequently with a banker. Interestingly, however, program participants were less likely to seek advice from a professor to develop a new project idea.

## 6.3 Behavioral skills

As discussed in section 2, the entrepreneurship training contained a module “for the person” aiming to develop entrepreneurial traits and behavioral skills. These behavioral skills are likely most malleable among youth (Almlund et al., 2011). In Tunisia, during qualitative interviews, some training facilitators stressed that as part of this module one of their main objectives was to change students’ behavioral skills to contribute to “turn them into entrepreneurs.” We now consider whether the program impacted a range of behavioral skills often associated with entrepreneurship.

First, Table 6 (Panel A) presents estimates of program impacts on risk and time preference parameters. Indicators of willingness to take risk include a direct self-reported measure (“on a scale from 1-10, how willing are you to take risks?”), as well as the certainty equivalent for an imaginary lottery where the respondent would have a 50 percent chance of winning 0 and a 50 percent chance of winning 2000 TND. Based on this last question, we also create a binary variable taking the value of 1 if the individual is a risk-taker (i.e. with a certainty equivalent larger than 1000 TND). Finally, we create a proxy for “patience”, taking a value of 1 if respondents reveal a preference for 1000 TND in 6 months rather than to 800 TND now. Table 6

(Panel A) shows no evidence that the program had an impact on self-reported risk and time preference parameters. Preference parameters appear stable and unaffected by the intervention.

Panel B of Table 6 contains a range of behavioral skills, sometimes referred to as soft skills, entrepreneurial skills, or personality traits. The first five indicators are from the “Big Five” scale, the most common measures of personality traits (Gosling, 2003; Almlund et al., 2011). The “Big Five” captures key soft skills including extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. Based on de Mel et al. (2010), we also include measures of behavioral skills capturing a range of entrepreneurial traits such as impulsiveness, passion for work, tenacity, polychronicity, locus of control, achievement, power motivation, centrality of work, and personal organization. All measures of behavioral skills are externally standardized so that they have a mean of 0 and a standard deviation of 1 in the control group. Therefore, all coefficients can be interpreted in terms of standard deviations from the average “level” of these skills in the control group.

The results reveal that the intervention led to measurable, significant, and robust changes in several domains of the “Big Five.” First, assignment to the entrepreneurship track led to a significant decrease in agreeableness. ITT estimates reveal a decrease ranging from 0.23 to 0.25 standard deviations compared to the level of agreeableness in the control group. This result is noteworthy because the literature has suggested that agreeableness is negatively associated with occupations such as business professionals or managers (Cobb-Clark and Tan, 2010).<sup>23</sup> To the extent that being less agreeable indeed contributes to making a better entrepreneur, these results suggest that behavioral skills for entry into self-employment can differ from behavioral skills needed to hold a salaried job. The types of behavioral skills shaped by the entrepreneurship training may therefore contribute to the partial substitution between wage employment and self-employment documented above.

Table 6 (Panel B) also show that the entrepreneurship track led to a significant (although less robust) increases in extraversion. This result is consistent with some of the emphasis of the entrepreneurship training on making students more outspoken and assertive.

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<sup>23</sup> Specifically, Cobb-Clark and Tan (2010) find that a one-standard deviation increase in agreeableness is associated with a 2.8 percent decrease in the probability of being a manager, and a 2.9 percent decrease in being a business professional.



The other two results related to the “Big Five” are more mixed. Table 6 (Panel B) reveals a decrease in conscientiousness and emotional stability among graduates who were assigned to the entrepreneurship track. Conscientiousness has been shown to be positively associated with a range of life outcomes (Almlund et al., 2011). These results may suggest that different behavioral skills are shaped through different formative experiences. It is possible that the process of writing an academic thesis – as students in the control group had to do - may be relatively more effective in shaping traits such as conscientiousness or emotional stability than entrepreneurship training.<sup>24</sup> By contrast, there is no evidence that the entrepreneurship training positively affected these traits.

The results also reveal some differences in entrepreneurial traits beyond the “Big Five.” A decrease in impulsiveness is observed: participants feel they reflect more before acting. At the same time, centrality of work increased, suggesting beneficiaries care more about their work. Most other entrepreneurial traits, including power motivation and tenacity, were unchanged, however.

Overall, the results confirm that behavioral skills can be malleable and that the entrepreneurship track affected them. They also suggest that different behavioral skills may be shaped by different types of training or activities. As such, the content of skills training requires particular attention since different skills map to different occupations: equipping trainees with a particular set of soft-skills mapping to entrepreneurial activities may not help them enter into wage employment.

#### 6.4 Optimism and attitudes towards the future

Some of the strongest results in Table 6 are displayed in Panel C and relate to attitudes towards the future. Beneficiaries report being much more optimistic about the future, are much more likely to report feeling like they are moving forward in life, or thinking about how to move forward in life. Students assigned to the entrepreneurship track also reveal having relatively more faith in the future compared to graduates from the control group. These results are robust and are

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<sup>24</sup> The decrease in conscientiousness may also be explained by conscientiousness being related to some facets of conformism, as well as a desire for “getting things done”, possibly leading to higher pay-offs than being meticulous when it comes to leading projects.

consistent across a range of different indicators measured independently<sup>25</sup>. Overall, these results suggest that program participants perceived a heightened sense of opportunities for the future.

### 6.5 Access to credit

Access to credit is one of the most frequently cited barriers to entrepreneurship, particularly in Tunisia.<sup>26</sup> The entrepreneurship track did not directly aim to alleviate credit constraints, but some aspects of the training involved providing information to students about credit applications, as well as connecting them to bankers. Table 7 (Panel A) shows that the treatment group was more likely to be confident to be able to obtain credit and to have actually applied for credit (conditional on having a business idea). However, they were not more likely to know how to apply for credit and were also no more likely to have obtained credit. These findings suggest that the intervention improved beneficiaries' confidence in obtaining outside credit. Still, they do not provide direct evidence that the intervention alleviated credit constraints.

As a robustness check, Panels B, C, and D in Table 7 present impact estimates for the main employment outcomes after removing prize winners from the sample. This is done by removing the 50 students who chose to enter the business plan competition and won a prize, even though in practice fewer than 15 students cashed their prize. While there is clearly selection into winning a prize, the winners were arguably students with the best prospects to become self-employed to start with. As such, removing winners from the sample most likely provide conservative estimates of program impact. Table 7 shows that, although program impacts on self-employment in permanent activities are not significant anymore, the results are overall very similar. As such, this robustness test suggests that the results in section 5 are mainly driven by the effects of business training and coaching, not so much by the seed capital attached to the competition, even though we cannot formally disentangle the two.

Finally, in the follow-up survey, graduates in the treatment group report that lack of access to credit remains the most binding constraint for entry into self-employment. In fact more than 70

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<sup>25</sup> The optimism indicator itself is aggregated from 6 questions

<sup>26</sup> Tunisia ranks 87<sup>th</sup> on the "ease of getting credit" indicator (see World Bank, 2012). Start-up financing is provided by the BFPME (Bank for financing Small and Medium Enterprises of 100,000 – 10 million TND) and the BTS (Bank for financing micro enterprises of <100,000 TND). Own funds required for a credit is between 35-40 percent at the MFPME and 10 percent at the BTS. There are also a number of support funds available such as FOPRODI (Industrial Decentralization and Investment Fund), or SICAR (a venture capital firm).

percent of program beneficiaries state that access to credit is the main constraint for entry into self-employment. Overall, evidence that the intervention improved access to credit is at most limited.

## **7. Conclusion**

This paper relies on randomized assignment to evaluate impacts from the introduction of an entrepreneurship track for applied university students in Tunisia. The new track offered business training and personalized coaching for students to develop a business plan for a project of their choice. Students had to defend the business plan (instead of undertaking an internship and writing a thesis) to graduate, and were also invited to submit the business plan to a competition. We evaluate the impact of randomized assignment to the entrepreneurship track on employment outcomes, as well as on intermediary outcomes such as business skills, networks, and behavioral skills.

We find that assignment of university students to the entrepreneurship track was effective in increasing self-employment among graduates approximately one year after graduation, but that the effects are small in absolute terms, ranging from 1 to 4 percentage points in the probability of being self-employed. Given the low prevalence of self-employment in the control group, these small absolute effects imply that beneficiaries of the pilot program were on average 46 to 87 percent more likely to be self-employed compared with graduates from the control group. However, the intervention did not increase the overall employment rate among beneficiaries. In partial equilibrium, these results suggest a substitution effect from wage employment into self-employment, similar to findings in Fairlie et al. (2012) in the U.S. They are also consistent with findings that private sector reservation wages are higher among participants in the entrepreneurship track. Therefore, the results highlight potentially important policy trade-offs between programs that aim to increase wage employment and programs that aim to foster entry into self-employment.

The evidence also reveals some of the channels behind the employment impacts by showing that the program fostered business skills, expanded business networks, as well as affected a range of behavioral skills and attitudes towards the future. For instance, participants in the entrepreneurship track were found to become more extroverted, less agreeable, less

conscientious, and less emotionally stable. These results point to differentiated skill needs in wage and self-employment, which can explain part of the observed substitution between wage employment and self-employment. Findings also suggest that different behavioral skills are shaped through different formative experiences, and that the process of writing an academic thesis may be relatively more effective in shaping traits such as conscientiousness than entrepreneurship training. As such, these results confirm that behavioral skills are indeed malleable, but also highlight that the content of skills training requires particular attention to the extent that different skills may be needed for different occupations.

As stated above, the design of the impact evaluation does not allow us to formally disentangle the effects of the entrepreneurship track (business training and personalized coaching) from the start-up capital offered to winners of the business plan competition. However, fewer than fifteen winners actually cashed their prize and evidence that the intervention alleviated credit constraints for participants is very limited. Indeed, most of the findings also remain robust when restricting the sample to students who did not win a prize. We interpret this as suggestive that the results are mainly driven by participation in the entrepreneurship track (training and coaching) rather than by the prizes. In fact, participants report lack of access to credit as the largest constraint to entry into self-employment.

Finally, the follow-up survey was conducted 3-6 months after the Tunisian revolution.<sup>27</sup> The occurrence of the revolution does not affect the internal validity of the findings, but the post-revolution political and economic context may have implications for their external validity. On the one hand, between 2010 and 2011, a large number of jobs were lost in the country, with immediate consequences for youth unemployment. In 2011, new social programs were rolled out and may also have affected job search intensity among graduates. On the other hand, students perceived the revolution as having improved prospects for growth opportunities in the medium term. The follow-up survey shows that most respondents had positive perceptions of their prospects in the labor market, including a stronger desire to find a job and to seek self-employment. Overall, it is therefore not clear how the context of the revolution may have affected the external validity of the findings related to labor market outcomes, and in particular

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<sup>27</sup> The baseline survey was collected between December 2009 and February 2010 and the follow-up survey was collected between April and June 2011. The Tunisian revolution took place in January 2011.

the relative attractiveness of wage employment and self-employment. Still, the results showing that participants to the entrepreneurship track are more optimistic suggest that graduates feel more confident to be able to benefit from new opportunities opened to them. As such, they point to the broader impacts of employment programs on youth behaviors and attitudes towards the future.

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**Table 1: Characteristics of Students in *Licence Appliquée* and Entrepreneurship Track**

		Number of students enrolled in "Licence Appliquée"	Number of applicants to entrepreneurship track	Application rate	Distribution among students in "licence appliquée"	Distribution among applicants	
Gender	Female	12,539	1,129	9.0%	67.1%	66.3%	
	Male	6,143	573	9.3%	32.9%	33.7%	
University	Gafsa	1,060	304	28.7%	5.7%	17.9%	
	Monastir	1,935	316	16.3%	10.4%	18.6%	
	Sfax	2,005	284	14.2%	10.7%	16.7%	
	Jendouba	1,550	216	13.9%	8.3%	12.7%	
	Ez-Zitouna	93	10	10.8%	0.5%	0.6%	
	Kairouan	1,237	109	8.8%	6.6%	6.4%	
	Carthage	2,012	120	6.0%	10.8%	7.0%	
	Gabès	1,798	108	6.0%	9.6%	6.3%	
	Sousse	2,351	141	6.0%	12.6%	8.3%	
	Tunis	1,010	61	6.0%	5.4%	3.6%	
	Tunis El-Manar	1,787	22	1.2%	9.6%	1.3%	
	Manouba	1,659	11	0.7%	8.9%	0.6%	
	Total		18,682	1,702	9.1%	100%	100%

Source : Observatoire National de l'Emploi et des Qualifications.



Table 2: Baseline Balance for Effective Sample

<u>Variables from Application Form</u>	N	Mean Control	Mean Treatment	Difference (T-C)	St. Err. for difference
Male	1580	0.33	0.32	-0.01	0.01
Subject: Food Science	1580	0.02	0.02	0.00	0.00
Subject: Humanities	1580	0.16	0.17	0.01	0.01
Subject: Sciences	1580	0.09	0.09	-0.00	0.01
Subject: Accounting	1580	0.09	0.09	-0.01	0.01
Subject: Economics and Finance	1580	0.08	0.08	-0.00	0.00
Subject: Civil Engineering	1580	0.02	0.02	0.00	0.01
Subject: IT	1580	0.10	0.10	-0.00	0.00
Subject: Telecommunication	1580	0.06	0.05	-0.00	0.00
Subject: Languages	1580	0.09	0.09	0.00	0.00
Subject: Business Administration	1580	0.03	0.03	0.00	0.00
Subject: Marketing	1580	0.04	0.04	0.01	0.01
Subject: Sports and Tourism	1580	0.03	0.03	-0.00	0.00
Subject: Technique	1580	0.15	0.15	0.00	0.00
Subject: Others	1580	0.03	0.03	-0.00	0.00
University Ez-Zitouna	1580	0.00	0.01	0.00	0.00
University of Tunis	1580	0.03	0.04	0.00	0.01
University of Sousse	1580	0.08	0.08	-0.00	0.02
University of Monastir	1580	0.19	0.18	-0.01	0.02
University of Kairouan	1580	0.07	0.07	0.00	0.01
University of Sfax	1580	0.16	0.16	-0.00	0.02
University of Gafsa	1580	0.18	0.19	0.02	0.01
University of Gabes	1580	0.07	0.06	-0.01	0.01
University of Manouba	1580	0.01	0.00	-0.01	0.01
University of Tunis El-Manar	1580	0.01	0.01	-0.00	0.01
University of Carthage	1580	0.07	0.07	0.00	0.01
University of Jendouba	1580	0.13	0.13	0.00	0.02
Applied in pair	1580	0.23	0.23	-0.00	0.01
Had a project idea when applying	1580	0.84	0.86	0.02	0.01
Age	1578	23.00	23.07	0.07	0.06
Single	1580	0.99	0.98	-0.01	0.01
Average grade in 2nd year of university (0-20)	1560	11.43	11.52	0.09	0.06
Lowest grade in 2nd year of university (0/20)	1443	6.16	6.22	0.05	0.14
Highest grade in 2nd year of university (0/20)	1539	17.05	17.09	0.03	0.10
Took entrepreneurship course	1580	0.74	0.76	0.02	0.01
Grade at entrepreneurship course	1184	13.61	13.53	-0.09	0.13
Knowledge of Arabic (1-5)	1580	3.71	3.67	-0.04	0.05
Knowledge of French (1-5)	1580	3.52	3.50	-0.03	0.04
Knowledge of English (1-5)	1580	3.09	3.08	-0.01	0.06
Ever worked	1580	0.70	0.72	0.02	0.02
Age at first job	1112	17.48	17.15	-0.32*	0.16
Duration of first job (months)	1105	5.93	6.35	0.42	0.76
First job: seasonal worker	1580	0.36	0.35	-0.00	0.03
First job: wage worker	1580	0.19	0.19	-0.01	0.02
First job: family aid	1580	0.06	0.05	-0.01	0.01
First job: self-employed	1580	0.08	0.11	0.03***	0.01
Has experience related to project	1580	0.62	0.63	0.02	0.02
Knows an entrepreneur	1580	0.59	0.63	0.04	0.02
Has helped an entrepreneur	1580	0.27	0.30	0.03	0.02

*Table continues on next page...*

...	N	Mean Control	Mean Treatment	Difference (T-C)	St. Err. for difference
<i>... continuing from last page</i>					
Is willing to take risk	1580	0.96	0.93	-0.02*	0.01
Prefers 1000 TND for sure to a salary between 500 TND and 1500 TND based on performance	1580	0.26	0.25	-0.01	0.02
Household size	1579	6.49	6.51	0.02	0.10
Father has primary education	1580	0.41	0.45	0.03*	0.02
Father has secondary education	1580	0.43	0.39	-0.03	0.02
Father has tertiary education	1580	0.16	0.16	-0.00	0.02
Mother has primary education	1580	0.66	0.67	0.01	0.03
Mother has secondary education	1580	0.28	0.27	-0.01	0.03
Mother has tertiary education	1580	0.06	0.06	-0.00	0.01
Father is salaried worker	1580	0.36	0.34	-0.02	0.02
Father is self-employed	1580	0.27	0.27	0.00	0.02
Father is retired	1580	0.25	0.26	0.01	0.01
Father is unemployed	1580	0.02	0.02	0.00	0.01
Mother is salaried worker	1580	0.09	0.09	-0.00	0.02
Mother is self-employed	1580	0.07	0.08	0.02	0.01
Mother is retired	1580	0.02	0.03	0.02	0.01
Mother is unemployed	1580	0.03	0.04	0.01	0.01
HH earnings between 0 and 300 TND	1580	0.25	0.25	0.00	0.02
HH earnings between 301 and 500 TND	1580	0.30	0.30	0.00	0.02
HH earnings between 501 and 800 TND	1580	0.21	0.20	-0.02	0.02
HH earnings above 801 TND	1580	0.24	0.25	0.01	0.02
Family can provide financial support	1580	0.64	0.63	-0.02	0.02
<u>Variables from Phone Survey</u>					
Baccalaureate: Humanities	1432	0.24	0.23	-0.01	0.01
Baccalaureate: Economics	1432	0.19	0.18	-0.01	0.02
Baccalaureate: Sciences	1432	0.23	0.25	0.02	0.02
Baccalaureate: Math	1432	0.19	0.20	0.01	0.02
Baccalaureate: Technical	1432	0.15	0.13	-0.02	0.02
Years since baccalaureate	1432	3.38	3.37	-0.01	0.04
Grade at baccalaureate (0-20)	1432	10.64	10.60	-0.04	0.05
Prefers 1000 TND for sure in 6 months to 800 TND now	1432	0.51	0.55	0.05**	0.02
Willingness to take risk (1-10)	1432	7.41	7.46	0.05	0.07
Certainty equivalent for a lottery with a 50 percent chance of winning 2000 TND and a 50 percent chance of winning 0 TND	1427	1,003.99	1,084.85	80.85**	33.57
Impulsiveness (normalized score)	1,432	0.00	-0.10	-0.10**	0.04
Passion for work (normalized score)	1,432	-0.00	0.02	0.02	0.06
Tenacity (normalized score)	1,432	-0.00	0.11	0.11*	0.06
Polychronicity (normalized score)	1,432	0.00	-0.01	-0.01	0.04
Locus of control (normalized score)	1,432	-0.00	0.08	0.08	0.06
Achievement (normalized score)	1,432	-0.00	0.19	0.19***	0.05
Power motivation (normalized score)	1,432	-0.00	0.01	0.01	0.07
Centrality of work (normalized score)	1,432	0.00	-0.04	-0.04	0.06
Personal organization (normalized score)	1,432	0.00	0.10	0.10*	0.06
Optimism (normalized score)	1,432	-0.00	0.05	0.05	0.05

Results reported: number of observations in survey; mean of treatment and control groups at baseline; difference between the two; and standard errors for difference between treatment and control group.

Results for effective sample for estimation (excluding attritors at follow-up)

Effective sample is 1,580 for variables in the baseline application form, and 1,432 for the baseline phone survey (due to the combined attrition in the baseline phone survey and the follow-up survey)

\* significant at 10 percent. \*\* significant at 5 percent. \*\*\* significant at 1 percent

**Table 3: Compliance with Assignment to Entrepreneurship Track (Marginal Effects)**

	Training completion		Training & coaching completion	
	(1)	(2)	(3)	(4)
Unemployment rate in governorate	0.01*	0.00	0.01*	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Subject: Economics, Finance, Business	-0.16*	-0.20*	-0.18*	-0.18*
	(0.04)	(0.05)	(0.04)	(0.05)
Male	-0.09**	-0.08**	-0.11*	-0.10**
	(0.04)	(0.04)	(0.04)	(0.04)
Applied in pair	0.12*	0.12*	0.06	0.06
	(0.04)	(0.04)	(0.04)	(0.04)
Had a project idea	0.09***	0.12**	0.05	0.09***
	(0.05)	(0.05)	(0.05)	(0.05)
Family can provide financial support	0.13*	0.06	0.17*	0.01
	(0.04)	(0.04)	(0.04)	(0.05)
Is willing to take risk	0.01	0.03	0.01	0.03
	(0.07)	(0.07)	(0.07)	(0.08)
Preference for stable salary	-0.01	-0.00	-0.01	0.02
	(0.04)	(0.04)	(0.04)	(0.05)
Household income 301-500 TND (ref = <300)	0.06	0.07	0.03	0.04
	(0.04)	(0.04)	(0.05)	(0.05)
Household income 501-800 TND	0.07	0.09***	0.05	0.06
	(0.05)	(0.05)	(0.05)	(0.06)
Household income > 800 TND	-0.02	0.02	-0.06	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)
University of Sousse (ref = Tunis)		0.02		0.20*
		(0.07)		(0.06)
University of Monastir		-0.01		0.20*
		(0.06)		(0.05)
University of Kairouan		0.11***		0.25*
		(0.06)		(0.05)
University of Sfax		-0.22*		-0.19*
		(0.07)		(0.07)
University of Gafsa		0.12***		0.29*
		(0.07)		(0.06)
University of Gabes		-0.09		-0.07
		(0.09)		(0.09)
University of Jendouba		0.15**		0.15**
		(0.06)		(0.07)
Number of observations	856	856	856	856
R2	0.063	0.093	0.0611	0.1184

Notes: Results shown are marginal effects from a probit model on determinants of compliance (defined as "training completion" in specification (1) and (2), and "training and coaching completion" in specifications (3) and (4)) among students assigned to the entrepreneurship track. 67% of selected students completed the training, 59% the training and coaching. \* p<0.01, \*\* p<0.05, \*\*\* p<0.1

**Table 4: Impacts on Employment Outcomes**

	N	C	T	Specification I				Specification II				Specification III			
				(1) ITT	St. Err	(2) TOT	St. Err	(3) ITT	St. Err	(4) TOT	St. Err	(5) ITT	St. Err	(6) TOT	St. Err
<b>A. Self-Employment</b>															
Self-employed in last 12 months	1,580	0.05	0.09	0.04***	0.01	0.07***	0.02	0.04***	0.01	0.07***	0.02	0.04***	0.01	0.07***	0.02
Self-employed (any activity in last 7 days)	1,580	0.04	0.08	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02
Self-employed (excluding seasonal activities in last 7 days)	1,580	0.03	0.04	0.01*	0.01	0.02*	0.01	0.01*	0.01	0.02*	0.01	0.01	0.01	0.02	0.02
<b>B. Employment Status</b>															
Employed in last 7 days	1,580	0.28	0.29	-0.00	0.02	-0.00	0.04	-0.00	0.02	-0.00	0.04	-0.00	0.03	-0.00	0.05
Salaried worker in last 7 days	1,580	0.21	0.18	-0.03	0.02	-0.05	0.03	-0.03	0.02	-0.05*	0.03	-0.03*	0.02	-0.05*	0.03
Self-employed (any activity in last 7 days)	1,580	0.04	0.08	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02
Unemployed in last 7 days	1,580	0.48	0.49	0.01	0.03	0.01	0.05	0.02	0.03	0.03	0.05	0.00	0.03	0.00	0.05
Studying in last 7 days	1,580	0.19	0.18	-0.00	0.02	-0.01	0.03	-0.01	0.02	-0.02	0.03	0.00	0.02	0.00	0.03
Inactive in last 7 days	1,580	0.03	0.03	0.01	0.01	0.01	0.01	-0.00	0.01	-0.00	0.01	0.01	0.01	0.01	0.02
<b>C. Characteristics of Employment</b>															
Has contract	1,580	0.12	0.10	-0.02	0.02	-0.03	0.03	-0.02	0.02	-0.03	0.03	-0.02	0.02	-0.03	0.03
Covered by Social Security	1,580	0.05	0.06	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02
Work in large firm	1,485	0.07	0.07	0.00	0.01	0.00	0.02	-0.00	0.01	-0.01	0.02	0.00	0.01	0.00	0.02
Hours worked in last week	1,570	8.55	9.35	0.66	0.98	1.12	1.64	0.48	0.99	0.76	1.54	0.69	0.93	1.17	1.48
Total labor earnings (monthly)	1,502	1.22	1.14	-0.06	0.13	-0.11	0.20	-0.08	0.13	-0.13	0.20	-0.06	0.12	-0.11	0.20
Total labor earnings (monthly, log)	1,502	74.79	88.97	17.51	33.86	29.80	56.38	17.50	33.23	27.97	51.90	10.70	14.06	18.30	22.68
Reservation wage for private sector job (monthly)	1,579	473.50	491.20	17.13*	8.73	28.85**	14.68	12.03	9.56	19.09	14.91	18.76*	9.96	31.69*	16.18
Reservation wage for private sector job (log, monthly)	1,579	6.10	6.13	0.03*	0.02	0.06**	0.03	0.02	0.02	0.03	0.03	0.03*	0.02	0.06**	0.03
Reservation wage for public sector job (monthly)	1,577	487.86	491.45	4.15	7.30	6.99	12.00	-1.25	8.44	-1.99	12.96	5.18	8.66	8.75	13.85
Reservation wage for public sector job (log, monthly)	1,577	6.14	6.15	0.01	0.02	0.02	0.03	-0.00	0.02	-0.00	0.03	0.01	0.02	0.02	0.03
<b>D. Average effect size for impacts on Self-Employment</b>															
Self-employed in last 12 months				81%		136%		87%		138%		81%		138%	
Self-employed (any activity in last 7 days)				68%		114%		65%		104%		70%		119%	
Self-employed (excluding seasonal activities in last 7 days)				48%		81%		46%		74%		50%		85%	

Note: number of observation, average for control group, average for treatment group, intent-to-treat (ITT) estimates, standard errors for ITT estimates, treatment-on-the-treated (TOT) estimates for completing entrepreneurship training and attending coaching sessions, standard errors for TOT estimates. Standard errors clustered by strata in specification I and II, and by governorate in specification III.

In all specifications controls include strata fixed-effects (by gender and 14 subjects), as well as a set of control variables from the baseline application form, including age at first job, previous experience in self-employment, prior experience with projects, prior experience in helping an entrepreneur and mother's employment status.

Controls in specification II also include baselining behavioral skills of the respondents at baseline (patience, willingness to take risk, impulsiveness, tenacity and sense of achievement).

Sample size for Specification I and II: N=1,580. Sample Size for Specification III: N=1,432 (due to attrition in baseline phone survey)

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%.

**Table 5: Impacts on Business Skills and Networks**

	N	C	T	Specification I			Specification II			Specification III					
				(1) ITT	St. Err	(2) TOT	St. Err	(3) ITT	St. Err	(4) TOT	St. Err	(5) ITT	St. Err	(6) TOT	St. Err
<b>A. Business skills</b>															
Has practical experience in projects	1,577	0.37	0.48	0.10***	0.02	0.17***	0.04	0.11***	0.02	0.17***	0.03	0.10***	0.02	0.17***	0.03
Knows how to produce a business plan	1,579	0.45	0.77	0.31***	0.03	0.53***	0.05	0.32***	0.03	0.52***	0.05	0.31***	0.03	0.52***	0.05
Knows a business plan contains a commercial analysis	1,580	0.23	0.41	0.18***	0.03	0.30***	0.05	0.18***	0.03	0.29***	0.04	0.17***	0.03	0.29***	0.03
Knows a business plan contains a demand assessment	1,579	0.30	0.55	0.24***	0.03	0.40***	0.04	0.25***	0.02	0.39***	0.04	0.23***	0.04	0.40***	0.05
Knows a business plan contains a supply assessment	1,579	0.33	0.62	0.28***	0.03	0.47***	0.05	0.29***	0.03	0.47***	0.04	0.28***	0.03	0.47***	0.03
Knows a business plan contains a marketing plan	1,580	0.26	0.55	0.28***	0.04	0.48***	0.05	0.29***	0.04	0.45***	0.05	0.28***	0.02	0.47***	0.03
Knows a business plan contains a market share analysis	1,579	0.20	0.40	0.20***	0.03	0.34***	0.04	0.21***	0.03	0.34***	0.04	0.19***	0.02	0.33***	0.03
Knows a business plan contains a technical analysis	1,580	0.24	0.57	0.32***	0.03	0.55***	0.04	0.34***	0.03	0.54***	0.04	0.32***	0.02	0.54***	0.04
Knows a business plan contains a financial analysis	1,580	0.35	0.64	0.28***	0.03	0.48***	0.05	0.29***	0.03	0.47***	0.05	0.28***	0.03	0.48***	0.05
Knows a business plan contains a profitability analysis	1,579	0.27	0.47	0.19***	0.04	0.32***	0.06	0.20***	0.05	0.31***	0.06	0.18***	0.02	0.31***	0.03
<b>B. Networks</b>															
Registered at Employment Office	1,702	0.78	0.82	0.04	0.02	0.07*	0.04	0.04	0.02	0.06*	0.03	0.03*	0.02	0.06*	0.03
Knows an employment agent	1,580	0.14	0.28	0.13***	0.02	0.22***	0.03	0.15***	0.02	0.23***	0.03	0.13***	0.02	0.22***	0.03
Number of times spoke to employment agent in last month	329	2.26	1.83	-0.31	0.39	-0.42	0.47	-0.14	0.30	-0.18	0.36	-0.32	0.49	-0.43	0.60
Knows an entrepreneur	1,580	0.44	0.49	0.05*	0.02	0.08*	0.04	0.04	0.03	0.06	0.04	0.05**	0.02	0.08***	0.03
Number of times spoke to entrepreneur in last month	726	5.05	5.11	-0.01	0.65	-0.01	0.98	0.08	0.66	0.12	0.97	0.04	0.77	0.07	1.17
Knows a banker	1,580	0.25	0.31	0.06***	0.02	0.09***	0.03	0.06**	0.02	0.09***	0.03	0.06**	0.03	0.10***	0.04
Number of times spoke to a banker in last month	440	2.44	3.67	1.16**	0.53	2.00**	0.88	0.77	0.56	1.25	0.83	1.29*	0.74	2.27*	1.29
Would seek advice from professor on project idea	1,580	0.08	0.05	-0.03*	0.01	-0.04**	0.02	-0.03**	0.01	-0.05**	0.02	-0.03	0.02	-0.04*	0.03
Would seek advice from employment agent on project idea	1,580	0.32	0.31	-0.00	0.02	-0.01	0.03	-0.01	0.02	-0.02	0.03	-0.01	0.02	-0.01	0.03
Would seek advice from entrepreneur on project idea	1,580	0.48	0.51	0.03	0.02	0.05	0.04	0.04	0.03	0.07	0.04	0.03	0.02	0.05	0.03

Note: number of observation, average for control group, average for treatment group, intent-to-treat (ITT) estimates, standard errors for ITT estimates, treatment-on-the-treated (TOT) estimates for completing entrepreneurship training and attending coaching sessions, standard errors for TOT estimates. Standard errors clustered by strata in specification I and II, and by governorate in specification III.

In all specifications controls include strata fixed-effects (by gender and 14 subjects), as well as a set of control variables from the baseline application form, including age at first job, previous experience in self-employment, prior experience with projects, prior experience in helping an entrepreneur and mother's employment status.

Controls in specification II also include baselining behavioral skills of the respondents at baseline (patience, willingness to take risk, impulsiveness, tenacity and sense of achievement).

Sample size for Specification I and II: N=1,580. Sample Size for Specification III: N=1,432 (due to attrition in baseline phone survey)

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%.

Table 6: Impacts on Behavioral Skills and Attitudes towards the Future

	N	C	T	Specification I			Specification II			Specification III					
				(1) ITT	(2) St. Err	(2) TOT	(3) St. Err	(4) ITT	(4) St. Err	(4) TOT	(5) St. Err	(6) ITT	(6) St. Err	(6) TOT	(6) St. Err
<b>A. Preferences</b>															
Willingness to take risk (0-10)	1,575	6.06	6.10	-0.02	0.14	-0.03	0.24	-0.04	0.14	-0.06	0.21	-0.02	0.10	-0.03	0.16
Certainty equivalent for lottery with 50% chance of winning 0 and 50% chance of winning 2000DT	1,556	674.44	694.33	16.21	19.53	27.43	31.83	-2.89	17.97	-4.62	27.78	14.32	18.95	24.34	31.71
Risk taker	1,556	0.18	0.18	-0.01	0.02	-0.01	0.03	-0.02	0.02	-0.03	0.03	-0.01	0.02	-0.02	0.03
Patience	1,577	0.27	0.29	0.02	0.02	0.03	0.04	0.00	0.02	0.00	0.03	0.02	0.02	0.03	0.03
<b>B. Behavioral Skills</b>															
Big 5: Extraversion (normalized score)	1,580	-0.00	0.11	0.10**	0.05	0.18**	0.07	0.05	0.05	0.08	0.08	0.11**	0.05	0.18**	0.08
Big 5: Agreeable (normalized score)	1,578	-0.00	-0.23	-0.24***	0.05	-0.40***	0.08	-0.23***	0.05	-0.37***	0.08	-0.25***	0.04	-0.42***	0.06
Big 5: Conscientiousness (normalized score)	1,577	-0.00	-0.14	-0.14**	0.05	-0.24***	0.08	-0.13**	0.06	-0.21**	0.09	-0.14***	0.04	-0.24***	0.06
Big 5: Emotionnally Stable (normalized score)	1,579	0.00	-0.11	-0.11**	0.04	-0.18***	0.07	-0.07*	0.04	-0.12**	0.06	-0.12**	0.05	-0.20**	0.08
Big 5: Openness (normalized score)	1,577	0.00	-0.02	-0.03	0.04	-0.05	0.06	-0.03	0.04	-0.05	0.06	-0.04	0.04	-0.06	0.06
Impulsiveness (normalized score)	1,573	0.00	-0.12	-0.12**	0.05	-0.21**	0.09	-0.11	0.07	-0.18*	0.11	-0.13**	0.06	-0.22**	0.09
Passion for work (normalized score)	1,579	0.00	0.03	0.03	0.05	0.06	0.09	-0.01	0.06	-0.02	0.09	0.04	0.05	0.06	0.09
Tenacity (normalized score)	1,576	-0.00	0.03	0.04	0.05	0.07	0.08	0.01	0.05	0.02	0.08	0.05	0.04	0.09	0.07
Polychronicity (normalized score)	1,577	-0.00	-0.05	-0.05	0.05	-0.08	0.08	-0.03	0.05	-0.05	0.08	-0.04	0.06	-0.07	0.10
Locus of control (normalized score)	1,579	-0.00	0.02	0.02	0.06	0.03	0.10	0.01	0.06	0.02	0.10	0.03	0.05	0.04	0.08
Achievement (normalized score)	1,576	-0.00	0.02	0.04	0.06	0.06	0.10	-0.02	0.05	-0.03	0.08	0.04	0.04	0.07	0.06
Power Motivation (normalized score)	1,574	0.00	-0.05	-0.04	0.05	-0.07	0.09	-0.10*	0.05	-0.15*	0.08	-0.04	0.04	-0.06	0.07
Centrality of work (normalized score)	1,578	-0.00	0.09	0.10*	0.05	0.16*	0.09	0.04	0.05	0.07	0.08	0.11**	0.04	0.19***	0.07
Personal organization (normalized score)	1,580	-0.00	0.08	0.08	0.07	0.14	0.11	0.05	0.07	0.07	0.11	0.09	0.06	0.15	0.10
<b>C. Attitudes towards the future</b>															
Optimism (normalized score)	1,578	-0.00	0.12	0.13***	0.04	0.21***	0.07	0.12**	0.05	0.18***	0.07	0.13***	0.04	0.22***	0.06
Days feels moving forward	1,578	3.79	4.09	0.28**	0.11	0.47***	0.17	0.23*	0.13	0.37*	0.19	0.25*	0.14	0.43*	0.25
Days thinking about how to move forward	1,578	5.62	5.87	0.23**	0.11	0.39**	0.19	0.25**	0.12	0.39**	0.19	0.21*	0.12	0.36*	0.21
Has more faith in future now than last year	1,574	0.52	0.57	0.04*	0.02	0.08*	0.04	0.05*	0.02	0.07*	0.04	0.05	0.03	0.08	0.05

Note: number of observation, average for control group, average for treatment group, intent-to-treat (ITT) estimates, standard errors for ITT estimates, treatment-on-the-treated (TOT) estimates for completing entrepreneurship training and attending coaching sessions, standard errors for TOT estimates. Standard errors clustered by strata in specification I and II, and by governorate in specification III.

In all specifications controls include strata fixed-effects (by gender and 14 subjects), as well as a set of control variables from the baseline application form, including age at first job, previous experience in self-employment, prior experience with projects, prior experience in helping an entrepreneur and mother's employment status.

Controls in specification II also include baseling behavioral skills of the respondents at baseline (patience, willingness to take risk, impulsiveness, tenacity and sense of achievement).

Sample size for Specification I and II: N=1,580. Sample Size for Specification III: N=1,432 (due to attrition in baseline phone survey)

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%.

**Table 7: Access to credit and Robustness of Employment Results to exclusion of Prize Winners**

	N	C	T	Specification I				Specification II				Specification III			
				(1) ITT	St. Err	(2) TOT	St. Err	(3) ITT	St. Err	(4) TOT	St. Err	(5) ITT	St. Err	(6) TOT	St. Err
<b>A. Access to credit</b>															
Knows how to apply for credit	1,580	0.20	0.22	0.02	0.02	0.03	0.03	0.02	0.02	0.04	0.03	0.02	0.02	0.03	0.03
Expect to be able to obtain credit	1,568	0.30	0.39	0.08**	0.04	0.14**	0.06	0.09**	0.04	0.14**	0.06	0.09***	0.02	0.15***	0.03
Has applied for credit (for individuals with project idea)	674	0.04	0.08	0.04**	0.02	0.06**	0.02	0.05***	0.02	0.07***	0.02	0.04*	0.02	0.06*	0.03
<b>B. Self-Employment (Excluding Prize Winners)</b>															
Self-employed in last 12 months	1,530	0.05	0.09	0.04***	0.01	0.07***	0.02	0.04***	0.01	0.07***	0.02	0.04***	0.01	0.07***	0.02
Self-employed (any activity in last 7 days)	1,530	0.04	0.08	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02
Self-employed (excluding seasonal activities in last 7 days)	1,530	0.03	0.04	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02
<b>C. Employment Status (Excluding Prize Winners)</b>															
Employed in last 7 days	1,530	0.28	0.28	-0.00	0.02	-0.00	0.04	0.00	0.02	0.00	0.04	-0.00	0.03	-0.00	0.06
Salaried worker in last 7 days	1,530	0.21	0.17	-0.03	0.02	-0.05	0.03	-0.03	0.02	-0.05*	0.03	-0.03	0.02	-0.05	0.03
Self-employed (any activity in last 7 days)	1,530	0.04	0.08	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02	0.03**	0.01	0.05**	0.02
Unemployed in last 7 days	1,530	0.48	0.50	0.01	0.03	0.02	0.05	0.02	0.03	0.04	0.05	0.00	0.03	0.00	0.05
Studying in last 7 days	1,530	0.19	0.18	-0.01	0.02	-0.01	0.03	-0.01	0.02	-0.02	0.04	0.00	0.02	0.01	0.03
Inactive in last 7 days	1,530	0.03	0.03	0.00	0.01	0.01	0.01	-0.01	0.01	-0.01	0.01	0.00	0.01	0.01	0.02
<b>D. Characteristics of Employment (Excluding Prize Winners)</b>															
Has contract	1,530	0.12	0.10	-0.01	0.02	-0.03	0.03	-0.02	0.02	-0.03	0.03	-0.01	0.02	-0.02	0.03
Covered by Social Security	1,530	0.05	0.06	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.02
Work in large firm	1,439	0.07	0.08	0.01	0.01	0.01	0.02	0.00	0.01	0.00	0.02	0.01	0.01	0.01	0.03
Hours worked in last week	1,520	8.56	9.30	0.69	0.91	1.22	1.58	0.57	0.91	0.93	1.47	0.63	0.97	1.11	1.63
Total labor earnings (monthly)	1,456	1.22	1.13	-0.07	0.12	-0.13	0.20	-0.08	0.12	-0.14	0.19	-0.07	0.13	-0.13	0.23
Total labor earnings (monthly, log)	1,456	74.89	88.97	17.69	34.29	31.39	59.44	19.13	33.85	31.76	54.84	12.53	15.99	22.47	27.03
Reservation wage for private job (monthly)	1,529	473.7	490.0	15.35*	8.91	26.96*	15.40	10.29	9.98	16.95	16.01	16.73	10.26	29.57*	17.41
Reservation wage for private sector job (log, monthly)	1,529	6.10	6.13	0.03*	0.02	0.05*	0.03	0.02	0.02	0.03	0.03	0.03*	0.02	0.06*	0.03
Reservation wage for public sector job (monthly)	1,527	487.8	490.1	2.45	7.99	4.31	13.64	-3.24	9.39	-5.34	15.00	3.68	8.28	6.51	13.87
Reservation wage for public sector job (log, monthly)	1,527	6.14	6.15	0.01	0.02	0.02	0.03	-0.01	0.02	-0.01	0.03	0.01	0.02	0.02	0.03

Note: number of observation, average for control group, average for treatment group, intent-to-treat (ITT) estimates, standard errors for ITT estimates, treatment-on-the-treated (TOT) estimates for completing entrepreneurship training and attending coaching sessions, standard errors for TOT estimates. Standard errors clustered by strata in specification I and II, and by governorate in specification III.

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Sample size for Specification I and II: N=1,580. Sample Size for Specification III: N=1,432 (due to attrition in baseline phone survey)

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%.