Can Government Intervention Make Firms More Investment-Ready? A Randomized Experiment in the Western Balkans[#]

Ana Paula Cusolito, *World Bank*

Ernest Dautovic, *European Central Bank* and *University of Lausanne*

David McKenzie, *World Bank*

Abstract

Innovative firms with good ideas may still struggle to fine-tune them to the stage where they can attract outside funding. We conduct a five-country randomized experiment that tests the impact of an investment readiness program. Firms then pitched their ideas to independent judges. The program resulted in a 0.3 standard deviation increase in the investment readiness score. Two years later, the average impacts on firm investment outcomes are positive, but small in magnitude, and not statistically significant. Larger and statistically significant impacts on receiving outside funding occur for smaller firms, and for firms with lower likelihoods of otherwise being funded.

Keywords: Investment readiness; start-ups; innovation; equity investment; entrepreneurship; randomized controlled trial.

JEL codes: L26, M2, M13, O1

[#] Funding for this project was received from the European Commission. Funding to support the impact evaluation from the World Bank i2i Trust Fund is gratefully acknowledged. We gratefully acknowledge valuable research assistance from Ornella Darova; and comments from the editor, three anonymous referees, audiences at various seminars, and from Marius Starke, Janko Milunovic and Peter Trapp. This experiment and a pre-analysis plan were registered in the AEA RCT registry on October 2, 2015: https://www.socialscienceregistry.org/trials/895

1. Introduction

Even when innovative start-ups and SMEs in developing and transition countries have good ideas, they may not have these ideas fine-tuned to the stage where they can attract outside funding. This is the case in the Western Balkans, where there is a perceived lack of investment readiness of innovative start-ups to be in a position where they can compete for, and take on, outside equity (Karajkov, 2009). The most common reasons for a lack of investment readiness include a reluctance of entrepreneurs to surrender partial ownership and control of their business, lack of knowledge about the availability of external sources of finance, low investability of business development propositions, a lack of understanding about the key factors investors look for in making investment decisions, and presentational failings such as deficiencies in business pitches (Mason and Kwok, 2010).

While historically government assistance to small firms has taken the form of basic business training and loan support, there has been rapid growth in other types of programs designed to spur and support more innovative start-ups and to help them attract outside funding. Policymakers seeking to assist potential high-growth firms face a choice along a continuum between high-intensity, individualized programs that can be difficult to scale, and less-intense programs that can cater to many firms, but potentially not have sufficient intensity to improve them. The most common intensive approach is to support business accelerators and incubators. These often offer firms some seed capital and workspace, in addition to training and mentoring. Globally, the number of accelerators and incubators grew more than fivefold between 2009 and 2018, reaching over 2,500 active structures (Roland Berger, 2019). However, the majority of these only work with small cohorts of 10 to 20 firms at a time (e.g. Y-combinator and Tech-

stars), and they can be expensive to establish and run.[1] For example, Start-up Chile takes 100 firms a year at a cost of $15 million (Gonzalez-Uribe and Leatherbee, 2018). The contrasting approach has been to offer short courses of classroom-based or online training over short periods.[2] While governments and NGOs have spent billions on training programs, the majority of these efforts are aimed at building the basic business skills of aspiring or new entrepreneurs, or in teaching start-ups how to write a business plan, and not on readying innovative firms to attract equity finance.

Investment Readiness Programs are a relatively new intervention that provide a middle ground between the intensive and expensive accelerator/incubator approach, and the cheap and quick classroom training approach. They are intended to provide a comprehensive approach to overcoming the constraints to firms receiving outside investment through a mix of individualized training, mentoring and coaching, at an intensity that is sufficient to make firms more investment-ready, while maintaining a cost that is low enough to be scalable to large numbers of firms (Mason and Harrison, 2001; Mason and Kwok, 2010). While global data on the prevalence of these programs is not available, Appendix 1 provides 31 examples of investment readiness programs being used in a wide range of countries, including in the U.S. by the National Science Foundation, by several government agencies and the European Union in Western Europe, in Australia, New Zealand, Malaysia, Morocco, and in multiple countries in East Africa and

[1] Evaluations of these programs have relied on non-experimental approaches such as matching (Hallen et al, 2014; Smith and Hannigan, 2015; Yu, 2016) and regression-discontinuity (Gonzalez-Uribe and Leatherbee, 2018), and typically pool together multiple cohorts of firms in order to reach a sample size sufficient to detect impact. These studies have typically found participation in these programs to increase the chance of raising outside capital, although Yu (2016) finds the opposite.

[2] See McKenzie and Woodruff (2014) for a recent review. Several recent experiments test short training sessions for early-stage firms, but are not able to trace impacts through to the likelihood of receiving financing. Clingingsmith and Shane (2017) provide 30-minute pitch training to undergraduate students in Ohio, who then deliver 90-second pitches to judges, and finds training lowers scores on average. More promising is a 3-day intervention by Chatterji et al. (2018) among 100 growth-stage firms in India, which matches firms with peers in order to receive advice about people management. They find this has a positive impact on firm growth and survival for those matched to firms with active management styles.

Eastern Europe. However, to date there is no causal evidence as to the effectiveness of these programs, but only descriptive studies that do not have control groups (Mason and Kwok, 2010).

We conduct a five-country randomized experiment in Croatia, Kosovo, Macedonia, Montenegro and Serbia to test the effectiveness of an investment readiness program. A sample of 346 innovative SMEs were randomly divided into two groups: a treatment group that received a high-cost and intensive program that involved help developing their financial plans, product pitch, market strategy, and willingness to take equity financing, along with master classes, mentoring, and other assistance; and a control group which received access to an inexpensive online-only basic investment readiness course. After this program, both groups of firms competed in a pitch event, where they were scored by independent judges (blinded to treatment status) on their investment readiness.

The independent judges scored the pitches on six aspects of investment readiness: team, technology, traction, market, progress, and presentation, with each firm scored by five judges. We find that firms that went through the investment readiness program receive an average of 0.3 standard deviations higher investment readiness scores at this event, and are more likely to get selected to proceed to pitch in front of investors. We then track firm outcomes over the next two years via a six-month and two-year follow-up survey. We find positive, but statistically insignificant, impacts on firm survival, three categories of investment readiness, and on steps towards receiving external financing. Treated firms are 5 percentage points more likely to receive external financing, but the 95% confidence interval of (-4.7p.p., +14.7p.p.) includes zero and negative impacts.

We explore several possible explanations for this modest average effect of the program. The judges do appear to be measuring something meaningful, with higher scores from judges being

significant predictors of firm outcomes two years later. However, the magnitude of the average change in investment readiness coupled with that of the association between investment readiness and firm outcomes would predict impacts on firm financing that we lack statistical power to detect. A key reason for this low power is that some of the control group were more successful in getting outside funding than we had originally anticipated. Heterogeneity analysis then shows that the program only increased investment readiness for firms that were below the median size at baseline, and that for these firms, the program led to a statistically significant 15 percentage point increase in their likelihood of getting outside funding. Similarly, applying the Abadie et al. (2018) endogenous stratification methodology, we find the program had a positive and significant 12 to 14 percentage point impacts on the likelihood of getting external financing for firms that would otherwise have low likelihoods of getting such financing. The modest average effect of the program therefore arises from averaging larger effects for firms that would otherwise struggle to find financing with no effects on firms for whom finding financing is relatively easier. This points to the importance of correctly targeting these programs.

The remainder of this paper is structured as follows: Section 2 discusses what investment readiness programs are and the reason for their use in the Western Balkans; Section 3 outlines the experimental design and provides details of the intervention; Section 4 provides the impacts on investment readiness; Section 5 examines how investment readiness translates into firm performance; Section 6 explores different explanations for the modest average effect and shows treatment heterogeneity; and Section 7 concludes.

2. What are Investment Readiness Programs and Why Implement One in the Western Balkans?

2.1 What are Investment Readiness Programs?

While much policy attention around the world has been given to efforts to expand the supply of equity finance for innovative start-ups and SMEs (through seed and venture capital co-investment funds and other activities to attract capital), the effectiveness of these programs can be hampered by a lack of readiness of these firms to receive equity investment. Mason and Kwok (2010) highlight three main aspects of this lack of readiness: first, many entrepreneurs are believed to be equity-averse, unwilling to surrender any ownership stake in or even partial control of their firms; second, many businesses that seek external finance are not considered "investible" by external investors due to deficiencies in their team structure, marketing strategy, financial accounts, intellectual property protection, and other business areas; thirdly, even if entrepreneurs are willing to consider equity and have investible projects, presentational failings mean that many firms are unable to pitch their ideas successfully to investors.

Investment readiness programs are intended to increase the effective demand for equity financing by helping firms overcome the factors that result in a lack of investment readiness, thereby enlarging the size and quality of the pipeline of potential funding opportunities for investors and increasing the likelihood of new equity investments being made. Appendix 1 provides examples of these programs. While there is substantial heterogeneity in the content of these programs, the most comprehensive programs usually cover four dimensions, based on the core reasons that many investment deals do not materialize (Mason and Harrison, 2001; Mason and Kwok, 2010). The first dimension aims at reducing equity aversion, by explaining to entrepreneurs the potential advantages that equity can bring to the firm, both as a source of funding, and also because of the knowledge outside investors can bring to the firm. The second dimension addresses the investability of the business by helping to train the entrepreneur to demonstrate that they have a viable revenue model, can measure market traction, have dealt appropriately with property right

issues, have a competitive strategy, etc. The third dimension works on the presentational skills, teaching the entrepreneur how to effectively pitch their business ideas and provide the key information investors are looking for. Finally, some programs also offer a networking dimension, aiming to facilitate the matching process between entrepreneurs and investors through events such as venture forums.

These programs tend to be subsidized by governments, even in developed economies like the U.S. and U.K. There are several possible reasons to justify subsidies. The first is that the targeted firms are frequently liquidity constrained, and therefore unable to pay. Some incubator and accelerator programs like Y-Combinator overcome this constraint by investing seed capital in the firms in exchange for an equity stake in the business. But since equity-aversion is one of the key constraints investment readiness programs are trying to overcome, investment readiness programs have typically not required equity stakes in exchange for participation. Secondly, since many of these programs are new in nature, potential entrepreneurs may find it hard to assess in advance the overall quality of the program, and their payoffs from participation are highly uncertain, making them unwilling to pay the costs of participating. Finally, governments may justify the subsidies in terms of the public benefits (more innovation, higher tax revenues, greater employment) that can come from successful ventures.

2.2 Why an investment readiness program in the Balkans?

Increasing innovation is a key regional priority in the Balkans region as way to boost firm productivity and sustain economic growth. While it is generally accepted that debt finance is not the optimal source of funding for early-stage SMEs and start-ups, equity finance has historically only been marginally used in the region. For example, Vizjak and Vizjak (2016) report that in Croatia in 2014, only 15 start-ups received financing from venture capital funds and business

angels, totaling 21.8 million euros, while Gattini et al. (2016) report only one or two transactions per country in Kosovo and Montenegro. A regional report noted that there is a debate as to how much this lack of use of risk capital reflects a lack of supply of equity finance, versus a lack of readiness of entrepreneurs to attract and accept this financing (Karajkov, 2009). Based on the viewpoint that action was needed on both the supply and demand sides, the Enterprise Development and Innovation Facility (EDIF) initiative financed by the European Commission includes efforts to increase the supply of private equity to the region (including a 110 million euro fund), improve the legislative frameworks to better encourage venture capital activity, and undertake efforts to increase investment readiness. This paper provides an evaluation of the investment readiness component of this initiative.

3. Experimental Design

To implement this intervention, we ran a competitive procurement process where companies specializing in investment readiness programs provided bids. The winning firm was the company *Pioneers JFDI GmbH* (Pioneers henceforth). Founded in 2009 and based out of Vienna, they are one of Europe's leading platforms for entrepreneurship, organizing an annual "Pioneers Festival" (with 3000 attendees), as well as providing mentoring, pitch training, and opportunities for presentation and networking with European and international founders and investors. They launched a specific investment readiness program called *Pioneers of the Balkans* for this project.

3.1 Generating the Sample

Eligibility criteria for the program were developed by the World Bank and Pioneers team, conditional on the rules of the European Commission. To participate in the program, a firm had to be legally registered in at least one of the five countries: Croatia, Kosovo, Macedonia, Montenegro or Serbia. The firm had to be a micro, small, or medium-enterprise, defined as

having fewer than 250 employees, and an annual turnover below 50 million euros. It had to be innovative, meaning that "it will in the foreseeable future develop products, services, or processes which are new or substantially improved compared to the state of the art in its industry, and which carry a risk of technological or industrial failure", and could not be on a sanctions list or operating in a set of negative activities (e.g. gambling or alcohol production).

To launch the program, the brand *Pioneers of the Balkans* was created, and a dedicated website set up. The program was marketed as a competitive program designed especially for innovative entrepreneurs seeking or considering venture financing.[3] The main communications therefore promoted a major pan-regional start-up competition due to take place in two stages, with a Semi-finals in Belgrade and subsequent Finals event in Zagreb. It included a preliminary list of investors who had already confirmed their attendance at the Finals, and noted that selected firms would receive a training and preparation package.

We had set a target of 300 to 350 participating firms. In designing the program, both providers of investment readiness services and experts in the innovation agencies agreed that there was a limit on how many firms potential investors would be willing to listen to pitches from.[4] A two-stage process was designed to overcome this issue: the Semi-finals would be the main phase of our study, with all firms in the study having a chance to present their ideas in the semi-finals and get scored by independent judges on their investment readiness. Then only the top-50 would progress to the finals, with these firms selected on merit.

[3] This marketing will likely screen out firms completely opposed to equity, but still attracted firms who were uncertain about equity, with only 60 percent of our control group saying they were interested in equity financing in our first follow-up survey.

[4] A second, less binding, concern was to avoid having firms from the bottom tail of quality present to investors, in case this had negative spillover reputation effects. This meant avoiding having the worst performers pitch to investors, but the limit on investor attention was the binding constraint that meant only 50 could be selected.

Pioneers aimed to create broad awareness of the program among entrepreneurial firms in the region, launching the program at the start of August 2015 (see timeline in Appendix 2) and marketing the program rapidly. It used five major instruments to achieve this goal: public sources of information for applicants, direct electronic and physical mailings, social media marketing, a roadshow spanning all five target countries, incentives for early applications (a raffle for a dinner with two leading entrepreneurs from the region), and media relations. Applicants had to apply online, with the data from this application form providing the baseline data for this study. More than 1,200 applications were started online, and a total of 584 full applications were received. These were screened for eligibility, resulting in 346 firms being selected as eligible for the program.

This process succeeded in generating a sample of young firms involved in a wide range of innovative activities.[5] Table 1 provides descriptive statistics. At the time of application, firms had a mean (median) of 6 (4) employees, with a 10-90 percentile range of (1, 12). They had been in business for 2.5 years on average, and are involved in high-tech innovative industries such as cloud computing and big data, app development for a wide range of business and personal services, pharmaceutical products, etc. Half of the founders have post-graduate education, and 60 percent have a global rather than regional focus as their key market. While 35 percent of firms had accepted some outside funding, the majority of this was in the form of public grants and loans from family and friends, with only 9 percent having already accepted funding from an outside investor like a business angel or venture fund.

[5] Although we do not have a random sample of start-ups in the region with which to examine selection into the program, in Appendix 7 we benchmark firm characteristics against those of beneficiaries of the main program for start-ups of the Serbian Innovation Fund. We find considerable overlap in firm type, but that our sample also includes more established and larger firms than in their program.

To make clear the types of firms involved, it is worth giving some more specific examples of the types of innovation these firms are doing. Some examples are as follows:

- A firm that is developing virtual reality software that can be used in outdoor interactive missions, with the aim of deploying this in military training exercises and theme park adventures (e.g. a team-based maze/obstacle course where dragons and other objects are flying around)
- A firm developing an app that geo-locates users on ski fields in Europe, and provides a way for them to see where all their family members are at any point in time, and to direct them to common meeting places.
- A bio-tech firm that has developed a new coating for common medicines that allows the body to better regulate the dose-intensity, to reduce under- and over-dosages of medicines
- An architecture firm that has developed an innovative luxury "boatel" that runs on an electric motor and can be used on lakes
- A firm that has developed solar-powered benches for public spaces that can charge phones and also monitor air and noise quality.

A number of the firms were developing apps for the Balkan and global markets, covering a wide range of activities such as making it easier to use public transport, a local version of Uber, an app to connect consumers with producers of organic products, online sports coaching, and an app to manage freight logistics. But there are also firms involved in physical manufacturing of products, such high-end electrical bicycles, smart vending machines, indoor pet houses, and a USB charger that charges while bicycling.

3.2 Random Assignment

Applications closed on September 6, 2015 and were then screened to ensure they met the eligibility requirements. All applicants which met the formal eligibility criteria were accepted into the study. Eligible applications were then scored on four criteria to measure their initial level of investment readiness: market attractiveness, product technology, traction, and team. Appendix 3 describes the scoring methodology. The top 10 proposals overall in terms of score were then randomly assigned to 5 in treatment and 5 in control, in order to ensure that some of the very top proposals were in both groups. Then the remainder of firms were divided into strata based on country (Serbia, Croatia, or the rest), and on whether or not they already have a private investor. Within these six stratum firms were ranked into groups of four on the basis of their investment readiness score. Within these quartets two firms were randomly allocated by computer to treatment and two to control. This was done for an initial batch of 333 firms, allocating 167 to treatment and 166 to control. An additional batch took longer to verify their eligibility requirements and were received after this assignment, these were then also randomly allocated and form a separate strata. This resulted in 346 firms, with 174 treatment and 172 control. A pre-analysis plan was registered with the AEA trial registry on October 2, 2015 to pre-specify the initial outcomes of interest.[6]

This process resulted in treatment and control groups that are evenly balanced and comparable in terms of their initial characteristics. This is seen in Table 1. As a result, any difference in investment readiness at the conclusion of the program can be reliably assessed as the impact of the program and not due to any pre-existing differences across groups.

3.3 Details of the Treatment and Control Offerings

[6] https://www.socialscienceregistry.org/trials/895

The treatment and control groups were blinded to treatment status, and both were offered a form of investment readiness training – the difference being in the intensity, cost, and medium of the offerings. We summarize both treatment and control programs here. A key issue with understanding the impact of different training programs is that much of the literature does not provide sufficient detail on what was offered, leaving the program as a black box for others seeking to learn or compare. Therefore, in Appendices 4 and 5 we provide much more detailed information on each program.

The treatment group received an investment readiness program provided by Pioneers. This was an intensive two-month program that aims to prepare companies to be willing to consider equity, make key changes if needed to have systems in place that investors are looking for, and put them in a position where they are ready to talk with potential investors. The first phase ("qualification") was structured around an online training platform called *WhatAVenture.* Using this tool, individuals are asked to outline and self-critically assess their businesses by describing the problem or need addressed by their product or service, the commercialization concept and expected revenue streams, conduct a market sizing exercise, and describe their competitive positioning. Each business was assigned a lead mentor who supports them through this process and provides feedback and help.

After completing this first phase, firms were then brought into an "acceleration phase". In this phase they had individualized mentoring from both their lead mentor, and from a pool of more than one hundred specialized mentors who could help out on specific concrete and sector-specific needs. Appendix 4 provides examples of the types of advice received, which ranged from specifics of dealing with regulations, advice on valuation, pricing strategy, financing options, customer segmentation, technology, and other topics. Mentoring took place both on-site

and via video calls. During this phase, there were four masterclass weekends, which took place every week in October from Friday evening through Sunday afternoon. These masterclasses rotated around the different countries, and were recorded so that those who couldn't attend in person could access the contents online. Each workshop followed a similar format, but with the topics varying. On Friday evenings the attending entrepreneurs would have a chance to introduce themselves and their businesses in just 90 seconds with no presentation materials, and also see examples of the same from the mentors, followed by informal discussions. Saturdays would involve five to eight lectures and/or workshops, with themes such as sales and marketing, team building and human resources, and investment and finance. On Sundays, all participants and mentors focused on presentational skills as well as pitch deck structure and design. The final phase was a "pitch preparation phase" and took place in the last two weeks, in the run-up to the semi-finals. This included working on their pitch decks with their mentors, delivering practice pitches, and then on-site training in Belgrade the day before the semi-finals performance as a final practice run.

The total cost of the treatment is estimated to be $614,000, or approximately $4,000 per active participant.[7] The main component of the cost is the individual mentoring, which averaged $3,072 per beneficiary, with the masterclasses costing $793 per beneficiary and pitch training $230.

The control group companies were offered an e-learning course developed and distributed by the Global Commercialization Group (GCG) of the University of Texas at Austin. This course is distributed under the label Innovation Readiness Series™ and was launched in 2011. It is

[7] The exact cost per firm differs in terms of services contracted vs services actually delivered, since not all firms used all the mentoring hours they were allocated. Pioneers retrospectively estimates that the actual services delivered to the firms were approximately $3,000 based on actual hours mentoring used. Note further that this calculation does not include the costs of advertising the program through roadshows, or of putting on the semi-final and final events which were important in attracting firms to the program. These overhead costs are estimated at approximately $1,500 per firm (in both the treatment and control groups).

targeted to a broad audience of entrepreneurs, scientists, engineers, and students, with the goal in helping transform their innovative and technology-based concepts into a viable commercialization plan and a convincing pitch. The content is delivered online through 10 modules of 45-60 minutes each, with a multiple choice quiz at the end of each module. Appendix 5 provides descriptions of the content of each module. They cover key issues such as how to articulate the benefits of an innovation to customers and investors, intellectual property protection, market validation, comparing to competition, and how to pitch and present. The cost of the course was a one-time $5,000 set-up charge to customize to our program, and then $153 per firm.

There were several reasons for offering the control group an online investment readiness program rather than not providing any service at all.[8] The first was that, from a public policy point of view, a key question was whether an expensive and intensive program was needed, or whether identical results could be obtained by cheap and accessible online alternatives. This was considered the more interesting policy counterfactual than offering nothing at all. Second, from an evaluation standpoint, offering both groups an investment readiness program lowers the risk of Hawthorne and John Henry effects, since both groups were told they were being provided with an investment readiness program. Finally, we also believed that offering the control group something would minimize the risk of differential attrition compared to the treatment group.

3.4 Take-up

Of the 174 firms randomized into treatment, 157 (90.1%) completed the *WhatAVenture* online training platform, and 79.3% received individual mentoring. Conditional on using individual

[8] The sample size means that we did not have sufficient power to have more than 2 groups, so this prevented also adding a pure control group, or having treatments that would attempt to work on only one aspect of investment readiness.

mentoring, entrepreneurs received a median of 8 and mean of 11 hours of individual mentoring from the lead mentor and pool of specialist mentors.[9] These take-up rates are high compared to many business training programs, which average 65% take-up even for courses of only a few days (McKenzie and Woodruff, 2014). 76 out of the 174 (43.7%) attended at least one masterclass in person, but typically only attended the masterclass held in their country (videos of the masterclasses were also available online, with typically 10-20 firms watching each). There were approximately 1,150 mentoring hours provided during the masterclasses, of which around 390 hours were individual mentoring, and 760 hours were in the form of lectures and presentations. This represents an average of 15 hours per attendee. In addition, before the semi-finals, 76 firms (43.7%) attended a 3-hour final pitch presentation training.

Out of the 172 participants assigned to the control group, 120 (70%) accessed at least once the online Innovation Readiness Series™ platform. However, even conditional on accessing the platform, overall usage was relatively low. Conditional on accessing the online platform, 118 participants viewed at least once the modules' section and 55 viewed it at least 10 times; the mean number of views of the modules section was 21 and the median 9. Each module last approximately half an hour, so we can approximate that the mean time spent on the modules was 10 hours while the median 4.5 hours. Only 63 (37% of the control group) participated in one of the seven quizzes at the end of a module. A total of 51 control group entrepreneurs passed at least 4 quizzes with 45 attaining the threshold of 70% correct answers in all quizzes, necessary to receive a certificate of completion from the IC^2 Institute at the University of Texas at Austin.

[9] Note firms were eligible to receive up to 30 hours of individual mentoring time, so the majority of teams used considerably less hours than allocated to them. Pioneers attributes this in part to the other work and family commitments facing founders of small firms, as well as a desire by mentors to not over-mentor, only scheduling follow-up sessions when there was interest and clear areas to work on.

This low usage is common of many online-only programs, and has the advantage for our study of making it unlikely that the control program resulted in large improvements in firm outcomes.

4. Impacts on Investment Readiness as Scored by Judges

4.1 The Semi-finals and Judging Procedure

The semi-finals were held in parallel to, and in cooperation with, the Belgrade Venture Forum, an annual venture capital conference that took place from November 12 to 14, 2015. Participants were invited to present in a pitch event that follows the standard format of such events, with firms giving a 5-minute pitch of their business case, followed by 5 minutes of questions from a jury of judges.

Participation required the founder of the firm or a representative to be physically present in Belgrade. To encourage participation, firms received multiple reminders and calls, were sent an invitation letter with a ticket voucher that allowed them one day of free access to the adjoining Belgrade Venture Forum, and were provided with a transport subsidy that was sufficient to cover the cost of bus travel to the event. The travel time was approximately 4 hours from Croatia, 5 hours from Macedonia, and 6 to 7 hours from Kosovo and Montenegro. In total 211 of the 346 invited firms (61%) attended the semi-finals: 110 firms from the treatment group (63.8%) and 101 firms from the control group (58.1). The attendance rate was similar for Serbia (64%) and Croatia (67%), and lower for the other three countries (51%). We discuss robustness to this attrition in the next section.

A group of 66 independent judges was used to do the scoring. Panels of five judges were assigned to judge a session of six firms at a time, with judges then being rotated so that they are on panels with different judges for their next sessions. Each batch of six firms consisted of three treatment and three control firms, selected to have a similar range of initial investment readiness

scores, and grouped according to industry and country of operation. Judges were assigned to batches based on their availability (some were giving talks at the venture forum), industry, and technology used. Appendix 6 provides details of characteristics of these judges. They were a mix of investors, successful business owners, and experts in mentoring and coaching start-ups. 37 percent lived in one of the five countries taking part in the competition, while two-thirds were based in other countries. Eighty-percent of them regularly mentor start-ups, 64 percent were part of companies that make venture investments, and three-quarters had founded their own companies. They were therefore experienced in what outside investors are looking for in terms of investment readiness.

Judges were blinded to treatment status, and were not provided with any information about the company in advance of scoring. None of the judges had been involved as mentors in the program. They were briefed and asked to score each firm on six factors:

1) Team: the skills and capabilities of the entrepreneur and his or her team
2) Technology: the degree of innovativeness and technological advancement
3) Traction: indications of measureable market success
4) Market: the commercial market attractiveness and size of the potential market
5) Recent business progress: the amount of progress firms had made during the last three months (the time since initial application)
6) Presentation performance

An aggregate investment readiness score was then formed using the following weights: (team) 28%, (technology) 21%, (traction) 14%, (market) 7%, and (progress) 30%. These weights were not revealed to the judges, but were based on what seed- and early-stage investors would commonly focus on (Kaplan and Strömberg, 2004). They tend to emphasize the quality of the

team and their technology (Gompers et al, 2019), and the extent to which the business is continually improving. The presentation score was added to allow judges to independently assess how well the firm presented its ideas, and as "hygiene" factor that could be used if necessary to avoid placing someone unable to present in front of investors at the final. The correlation between this weighted score and an equally-weighted score is 0.995, and we show in Appendix 6 that our results are robust to this choice of weighting.

Based on these investment readiness scores, the top 54 firms were invited to the finals event.

4.2 Estimating the Impact on Investment Readiness as Scored by Judges

To estimate the impact of the program on investment readiness as scored by the judges, we use the following (pre-specified) base specification for firm *i* in stratum *s*:

$$Outcome_i = \alpha + \beta Treat_i + \sum_{s=1}^{S} c_s 1(i \epsilon s) + \varepsilon_i \quad (1)$$

Where $1(i \epsilon s)$ are strata dummy variables. Note that stratification implicitly controls for baseline investment readiness, country, and whether or not the firm has an outside private investor at baseline. Robust (Eicker-White) standard errors are used. As a robustness check, we also re-estimate equation (1) after controlling for judge fixed effects.

The parameter β is then the intention-to-treat effect (ITT). This measures the impact of being assigned to the treatment group, and being offered the expensive and intensive investment readiness program rather than the online course offered to the control group. We could also attempt to measure the local average treatment effect (LATE) of actually receiving treatment. Recall that 90.1% of the treatment group completed the *WhatAVenture* tool. However, all but one of the treatment group firms that attended the semi-finals (99.1%) had completed this tool, so the non-compliers to treatment status are firms for which we do not have investment readiness

scores. As such, the ITT and LATE are almost identical for the firms attending the semi-finals. We therefore just report the ITT results.

The first column of Table 2 presents the impact of treatment in our overall measure of investment readiness, as scored by the judges. This is our main outcome in this table, and so our main approach to multiple hypothesis testing for this set of outcomes is to rely on this aggregate. The control group has a mean investment readiness score of 2.9 (s.d. 0.9). We find that treatment increases this score by 0.284, which is significant at the 5 percent level. The magnitude is thus equivalent to 0.31 standard deviations. The second row of estimates show that this impact continues to hold after controlling for judge fixed effects, with a larger magnitude of 0.41. Figure 1 compares the baseline and competition distributions of investment readiness scores for the treatment and control groups, and shows there is a rightward shift in the distribution, so that these gains appear to be occurring everywhere except at the very top.

The next five columns of Table 3 examine which components of the overall score have improved with treatment. We find positive impacts on all five components (team, technology, traction, market, and progress), with the impacts statistically significant for three out of five measures, and significant for all five measures after controlling for judge fixed effects. The seventh row then examines the impact on the team's presentation score. Recall this is not included as part of the overall score, but was scored separately. We find that treatment resulted in a 0.37 unit (0.32 s.d.) increase in the team's presentational score, which is statistically significant at the 5 percent level. Treated firms are therefore more investment ready in terms of both being able to present their idea, and in terms of the quality of the idea presented. As a result, treatment doubles the likelihood of a firm being selected for the finals (discussed more in Appendix 6), from 12 percent in the control group. This effect is significant at the 10 percent level.

Our treatment, like most investment readiness programs, is a bundle of different components, including online training, mentoring, and networking, and we do not have independent verification with which to estimate which component mattered most. However, our descriptive evidence suggests that the main channel for improvement was working one-on-one with the mentor.[10] Treated firms that used more hours of mentoring were the ones that improved their investment readiness scores the most compared to their score at the time of application, whereas we see no association between attending masterclasses and the change in score, nor between talking with other firms from the program and this change in score.[11] A limited role for networking is also suggested by the fact that 51 percent of the treated firms said they did not talk to a single other firm from the program six months after the program, and the modal firm who did talk to other firms only talked to two others.

4.3 Robustness of the Impact on Judges' Scores

The investment readiness scores are only available for firms which participated in the semi-finals. This raises the concern of bias arising from differential participation patterns among treatment and control firms. The last columns of Table 1 examines balance on baseline characteristics by treatment status for the firms which participated in the semi-finals. We see that, overall, the sample still looks balanced on most observable characteristics, although the overall joint orthogonality test has a p-value of 0.086. Most importantly, the mean of the

[10] Pioneers notes to us that they believe the mentoring is more effective when firms have first thought through their idea and documented insights and issues to work on, which is why mentoring was preceded by the online WhatAVenture platform.

[11] We regress the change in score between baseline and the semi-finals for the treated firms on whether they attended masterclasses, the number of mentoring hours they received, and whether they network with other firms from the program. Only the number of mentoring hours has a significant association (p=0.025), with the point estimate suggesting a one standard deviation increase in mentoring hours is associated with firms improving 0.24 units in the investment readiness score, which is approximately the mean improvement for the treated group. However, this is only correlational, and it might be that the most ambitious and determined firms were the ones who used their mentors more, and who also made changes in their businesses to make their firms more investment-ready.

baseline overall investment readiness differs only by 0.02 between the two groups, and Appendix Figure 6.1 compares the full distribution of the baseline investment readiness score by treatment group and participation status, and shows the distributions also look similar. Our pre-analysis plan specified two approaches to examining the robustness of our results to this attrition: imputing scores for those who did not attend, and using Lee (2009) bounds. Appendix 6 shows the results are robust to both approaches, and are also robust to using alternative weighting schemes to aggregate the different components of the overall score. The program therefore succeeded in making firms more investment-ready, as judged by independent experts.

4.4 Did the Treatment Make Bad Ideas Clearer and/or Hasten the Death of Low Quality Firms?

Wagner (2017) and Clingingsmith and Shane (2017) note that one effect of training firms to better present their ideas can be to increase the signal contained in pitches, making it easier for judges to distinguish good from bad ideas. If this is the case, the positive average effect on judges scores that we observe may mask a negative effect for those with lower quality ideas, offset by an even larger positive effect for those with better quality ideas.

We investigate this possibility using several approaches. First, in the last column of Table 2, we consider as an outcome the standard deviation of the individual judge scores for a firm, with a higher standard deviation indicating more divergence amongst judges in their assessment of the firm. If treatment makes the signals in pitches more precise, we would expect to see less divergence in opinion amongst judges. We find a very small, and not statistically significant impact of treatment on this measure, which provides a first piece of evidence against the hypothesis that our program made it easier for judges to distinguish good ideas from bad. Second, in Appendix Table 6.3, we examine treatment heterogeneity with respect to the baseline

investment readiness score. If our program causes lower quality firms to present their ideas more clearly, we would expect the treatment impact to be lower for those with below median baseline readiness scores. Instead, we find positive and not statistically significant interaction effects with treatment on both the overall score and the presentation quality score, and no effect on the standard deviation of judge scores even for those with lower initial quality. Finally, in non-pre-specified analysis suggested by a referee, in Appendix Table 6.4 we estimate quantile treatment effects and cannot reject equality of impacts at the 10^{th}, 25^{th}, median, 75^{th} and 90^{th} percentiles.

In addition to the possibility that training helps make lower quality ideas clearer to outside judges, the literature has also raised the possibility that the feedback associated with programs may make those with lower quality ideas select out of running their firms faster (e.g. Yu (2016), Howell (2018)). Appendix Table 6.5 shows that it is not the case that firms with low quality (either in terms of baseline scores or as assessed by the judges) fail more quickly when assigned to treatment.

There are several potential reasons why these channels found in some of the literature do not apply here. Our firms are less nascent and have had time to get market feedback on their ideas - which contrasts with students pitching a hypothetical product in Clingingsmith and Shane (2017), and the mentors and program did not just give negative feedback to those with lower quality ideas, but provided tangible help to improve. As in Wagner (2017), this improvement effect appears to be larger than any precision effect.

5. Impacts on firm outcomes

The immediate impacts on investment readiness are seen in the performance in the semi-finals. We then track the firms over time to see whether this short-term improvement in investment

readiness translates into longer-term investment readiness and a higher likelihood of receiving external investments.

5.1 Measuring Firm Outcomes

Our main outcomes come from two rounds of follow-up surveys, in which we attempted to interview all firms, not only those who had participated in the pitch competition. The first round, intended to measure short-term effects, was taken between April and August 2016, corresponding to a period of approximately six months after the end of the investment readiness program and judging. The overall survey response rate was 79.2 percent, and does not differ significantly between treatment (79.9%) and control (78.5%). In addition, we collected information on operating status, number of employees, and whether negotiations for an outside investment had occurred for a further 12 percent of firms[12], resulting in basic data being available for 92.2 percent of firms.

The second follow-up survey took place between August 2017 and March 2018, corresponding to an average of two years since the intervention. Catalini et al. (2017) show that 75 percent of firms that receive venture capital financing in the U.S. receive their first financing within the first two years after incorporation. Although we might expect firms to be slower to raise funding in a less developed capital market, our firms have been in business an average of 2.5 years at the start of the competition, and so a further two years covers a window where we should expect many firms to receive external financing if they will ever do so. The overall survey response rate for this second follow-up was 85.0 percent, and again does not differ significantly between treatment (86.2%) and control (83.7%), with data on firm operating status and receipt of equity available for 94.5% of firms. Appendix 8 shows no significant difference in response rates by treatment

[12] Firms which refused to take part in the survey were asked if they would answer three questions for us, which is what enabled us to get this additional information.

status, and that treatment and control firms remain balanced on baseline observable data for those responding to the survey.

The follow-up surveys focused on measuring changes in the firm in three domains. The first is whether or not the firm is still operating (regardless of whether or not it has been sold to another owner). The second is investment readiness, where we focus on three aspects identified by Mason and Kwok (2009): (1) willingness and interest in taking on equity investment; (2) general investability, as measured whether there is a viable business of interest to investors in terms of employment, sales, and profits[13]; and (3) whether the firm has put in place specific measures investors want to see before making investments, such as separation of outcomes, revenue projections, knowledge of customer acquisition costs, tracking key metrics of traction, and covering intellectual property. The third and final domain looks at steps towards receiving external funding and then external financing received. Steps towards financing include contacting outside investors, making pitches, working with mentors or experts to help obtain financing, and entering into negotiations. Receipt of external financing considers new debt and equity investments, as well as receipt of incubator and accelerator grants. Our ultimate outcome is then a component of this receipt of external financing index, measuring whether the firm has made a deal with an outside investor.

We ask several questions under each domain and sub-domain. Our pre-analysis plan then specifies aggregating these measures to form standardized indices. This reduces concerns about multiple hypothesis testing by focusing on one aggregate outcome in each family of questions.

[13] Since the main goal of this intervention was to make firms readier to receive investment, this was the focus of our survey questions. Moreover, at this early stage many firms were not yet profitable and considered their revenue commercially sensitive, leading us to focus on whether they had positive revenues and profits, and whether revenues exceeded 25,000 euros.

Appendix 3 provides the exact questions used in forming each question, and Appendix 9 provides treatment impacts on each specific question used in these aggregate measures.

We supplement our survey measures of firm outcomes with an index measure of media buzz, which captures measures of whether firms are measured in any of more than 250,000 global news sources in 190 countries, and the number of twitter followers and Facebook likes they have attracted (see Appendix 3 for further details). This captures whether the firm is gaining attention and traction with customers, and has the advantage of being available for the full sample, with no attrition.

5.2 Treatment Impacts on Firm Outcomes

Table 3 presents the treatment effects of the investment readiness program on firm outcomes after estimating equation (1). Panel A shows the short-run impacts six months after the intervention, and panel B the impacts two years post-intervention. Column 1 shows that treated firms attracted more media buzz, with the 0.11 standard deviation increase after two years significant at the 5 percent level. Appendix Table 9.0 shows this largely comes from more mentions of the firm in global media. Column 2 examines firm survival. 10% of control firms had died by the first follow-up, and 25% by the second follow-up, two years post-intervention. These high death rates are higher than the average rates in developing countries, and likely reflect the firms being young and in relatively developed countries (McKenzie and Paffhausen, 2018). Treatment increases survival by 7.2 percentage points after two years, however this is not statistically significant at conventional levels (p=0.112).

Columns 3 through 7 then examine our index measures of investment readiness and investment outcomes. In the short-term (6 months post-intervention) there is a reduction in external investment which is significant at the 10 percent level, which comes through less debt financing,

and no other significant impacts. After two years, the treatment effects on all survey outcomes for the firms are positive, but not statistically significant, and are below 0.1 standard deviations in magnitude for all of our index outcomes. Finally, in the last column we examine whether the firm had made at least one deal with an outside investor since the start of the program (August 2015). 24.4 percent of the control group have made such a deal after two years. The treatment group is 5 percentage points more likely to have made a deal with an outside investor over the two years, but this is not statistically significant, with a 95 percent confidence interval of (-4.7p.p., +14.7p.p.).

Appendix 9 shows impacts on the individual measures that make up these aggregate indices. The intervention has a large and significant (p=0.013) impact on employment after two years of 4.5 workers, which almost doubles the employment level in the control mean. Employment is often a key policy outcome by itself, and so this program would compare favorably to a number of other programs when judged on employment alone. However, if we correct for testing 25 different outcomes that make up the aggregate indices, this impact is no longer statistically significant (p=0.425).

6. Why Does the Increase in Investment Readiness Result in Largely Null Effects on Firm Outcomes?

Our results show that firms receiving the investment readiness program were rated as more investment-ready by judges, increased their market traction in terms of capturing media attention, and yet we do not find significant effects on our longer-term survey measures of investment readiness or in ultimately making a deal with an investor. We consider three different potential explanations for these null results: that the change in investment readiness scores does not capture actual changes in investment readiness; that the study is low-powered; and that the

small average effect masks significant effects for a subgroup of firms who would otherwise find funding harder to get.

6.1 Do the Judges' Investment Readiness Scores Actually Capture an Increase in Investment Readiness?

A first possible explanation for a lack of significant treatment impact on firm investment outcomes could be that increases in the scores do not actually reflect improved investment readiness. This could arise from either (i) treatment status influencing how a particular pitch is scored, independently of its actual quality; or (ii) the scores not capturing aspects of the firm that actually matter for investment outcomes.

We could see a treatment impact on investment readiness scores, without any true change in investment readiness if the control firms get discouraged from not receiving the treatment and so perform badly in their pitch, or if the judges know which firms are treated and consciously or subconsciously score treated firms higher. We do not think either effect is likely in our case. The control firms were also told they were selected for the investment readiness program,and got offered the online class for preparation. Given the dispersion of firms across cities, countries and sectors, their social networks were not closely intertwined, and we did not see treated firms posting specifics of the content of their interventions on their social media feeds. Firms did not get to watch the pitches of other firms in the competition, and we received only one case of a firm in the control group asking why they had received a different set of services to others in the program. Moreover, the control firms still had the incentive to try their best in the pitches given that it would determine whether they were selected for the finals. The judges had neither the knowledge of which firms were treated, nor any incentive to score treated firms differently had they known. They were told that all firms participating were part of an investment readiness

program, and were not involved in other parts of the program. Given the length of the pitches, firms focused on describing their firm and its product, rather than their participation in the program, and the questions from judges were focused on typical issues like pathways to scale, competitive and regulatory issues, metrics of traction, how the firm was valuing itself, etc.

Secondly, it could be that the scores do not actually capture aspects of the firm that matter for being investment ready. To investigate this possibility, we test whether judges' scores are informative about future outcomes for the firm using the control group sample to run the regression:

$$Outcome_i = \mu + \theta Investment\ Readiness_i + \gamma_i' X_i + \varepsilon_i \quad (2)$$

We carry out this estimation first with no additional controls, and then with controls *X* for a large set of baseline information about the firm and owner: country (dummies for Serbia and for Croatia), whether or not the firm had received funding from an outside investor at baseline, the business sector (dummies for business and productivity, and lifestyle and entertainment sectors), firm age, whether the firm classifies itself as early-stage, the number of employees in the firm, and the age and gender of the founder. We estimate this separately by survey, to examine results at different time horizons.

Table 4 presents the results. We see that the judges' scores of investment readiness are positively associated with all of our firm outcomes, both with and without the inclusion of these baseline controls. The relationship is strongest for media buzz, taking steps towards investment, the external investment index, and making a deal with an investor. Even after controlling for a range of baseline characteristics, these associations are significant at the 1 percent level over two-year horizons. The scores also significantly predict being interested in equity and meeting the specific needs of investors over the six-month horizon, although this relationship weakens over the two-

year horizon. The magnitudes for these significant associations suggest a one unit change in the judge scores (which had a mean of 2.9 and standard deviation of 0.9) would result in a 0.19 to 0.33 unit increase for our index measures, and a 16.3 percentage point increase in the likelihood of making a deal with an investor.

6.2 Is the Null Effect Really a Modest Effect with Insufficient Statistical Power?

A second explanation for the lack of statistical significance is that we lack statistical power to detect the effect of the program on firm outcomes. We have that treatment has a causal impact ($\hat{\beta} = 0.28$) on the investment readiness score received from judges, and that this investment readiness score in turn is a significant predictor (with coefficient $\hat{\theta}$) of firm outcomes in the control group sample. Combining these two estimates allows us to obtain an estimate of the *predicted treatment effect* $\hat{\beta}\hat{\theta}$. This predicted effect is shown for each outcome in Table 4. It assumes that the only impact of the investment readiness program on firm outcomes is captured through the investment readiness score, that the association between score and outcomes observed in the control group is causal, and that the sequential ignorability assumption of Imai et al. (2011) holds.[14] Although these assumptions can be questioned, we believe such an exercise is useful in providing a sense of the magnitudes we might expect to see for treatment effects, given how much our program affected investment readiness scores, and how much a change in scores in turn predicts future outcomes.[15] We see that the predicted treatment effects are small in absolute terms: each of our index measures is predicted to increase by only 0.04 to 0.09 over two years, and the predicted increase in the likelihood of receiving outside funding is 4.6 percentage

[14] The sequential ignorability assumption requires that if there are heterogeneous treatment effects, it is not the case that the firms for whom treatment increases investment readiness scores are different from the firms for which an increase in investment readiness scores would increase future outcomes.

[15] For example, McKenzie and Woodruff (2017) show that this approach yields predicted magnitudes of business training interventions on firm outcomes that are similar to those obtained by experimental studies.

points. Our estimated treatment effects in Table 3 are similar in magnitude to these predicted treatment effects.

This program is the first randomized experiment of its kind, but like a number of other experiments involving larger firms, the sample size is set by external constraints in terms of the number of firms that the program attracts and caters to, rather than being a choice parameter. Given the sample size, our funding proposal calculated that we would have 80% power to detect a 0.23 increase in the investment readiness score, based on the mean and standard deviation of the baseline score measure and not accounting for the power gains from stratification. Our estimated treatment effect of 0.28 exceeds this level. In contrast, our funding proposal assumed that it would be very rare for control group firms to receive outside funding, assuming a mean of 3 percent, and then estimated a minimum detectable effect size of 8 percentage points at 80% power, not accounting for the power gains from stratified randomization (since we did not know how strongly our strata would be correlated with the end outcome).[16]

In practice, our estimated impact on receiving outside funding is 5 percentage points (similar in magnitude to the predicted impact $\hat{\beta}\hat{\theta} = 0.046$), which is less than this minimal detectable effect. But the larger reduction in power comes from the control mean being much higher than anticipated. While we expected very few control firms to receive external financing, in practice 24.4 percent of control firms had made a deal within two years. It is much harder to detect an 8 percentage point increase from a control mean of 24.4% than from a control mean of 3%: under our baseline assumptions, power would drop to 33.3% at this mean level, and the minimal detectable effect size is now a 13.7 percentage point increase. So a key reason for not being able

[16] We did not have baseline information on our index measures, and did not develop ex-ante power calculations for them. The ex-post minimal detectable effect (MDE) sizes based on the standard errors in Table 3 are 0.22 to 0.25, which are considerably larger than our point estimates.

to detect a treatment effect on external investment is that control firms found it easier to get investment than we had anticipated. Our surveys provide additional information on the types of external financing control firms were able to get. 74 percent of those receiving funding made an equity-sharing deal, and 18 percent a deal for royalties. The main investors were other firm owners (56%), venture capital funds (35%), angel investors (32%), government funds (23%), accelerators (12%) and selling the firm outright (12%).[17]

Thus while we increased investment readiness scores, we did not increase them by enough to register large enough changes in investment outcomes to be detectable with our sample size. Our confidence intervals enable us to rule out the program having large absolute impacts on these outcomes, but are wide enough to allow for the program to have moderate sized impacts that are commensurate with what we would expect given the change in investment readiness and how investment readiness correlates with firm outcomes.

6.3 Does a Modest Average Effect Mask Larger Impacts for Some Firms?

Although the average control firm was more likely to have received investment funding than we had initially anticipated, there is considerable heterogeneity in the sample, and some firms found it harder to get funding than others. The firms in our study are very heterogeneous in size at the time of applying: 15.6 percent only have a single worker, another 32.1 percent only have one or two workers, 31.8 percent have four to six workers, and 20.5 percent have six or more workers. In the absence of our program, smaller firms are likely to be less investment ready and find it harder to get external funding: the judges investment readiness score for control firms averaged 2.7 for firms with 1 to 3 workers (below the median size), versus 3.2 for those with 4 or more workers (p=0.004), and 14 percent of control firms with 1 to 3 workers had received external

[17] Note that percentages do not add to 100 since firms can receive investments from multiple sources.

financing at our 2 year follow-up, versus 35 percent of those with 4 or more workers (p=0.002). This raises the possibility that the treatment worked better for smaller firms, who had more scope to improve.

We did not pre-specify examining treatment heterogeneity by firm size, but it was suggested by a referee and makes sense in light of the variation in initial firm size and the association between firm size and our key outcomes in the control group. We split the sample by whether or not baseline size is below the median of 4 workers, with 47.7 percent of firms having 1 to 3 workers, and then add a dummy variable for median size or more, and its interaction with treatment, to equation (1).

Table 5 reports the results. The first point to note is that the dummy variable for median size or higher is positive and significant for six of our key outcomes, and is most significant for external investment and making a deal with an investor. That is, smaller firms are scored by judges as less investment-ready, have less media buzz, survive less, score lower in general investability, and are less likely to receive external investments than larger firms in our sample. Second, looking at the treatment dummy, we see that the investment readiness program had positive and significant effects for below median-sized firms on their investment readiness score (+0.47 points), their media buzz (+0.16 units), their external investment index (+0.19 units), and most critically, on their likelihood of making a deal with an investor (15.6 percentage points). In contrast, the interactions with being of median size or above are negative for all of these outcomes, and significantly so in the case of the external investment index and making a deal with an outside investor. The magnitudes of the interaction suggest that the treatment had no impact on improving the investment readiness score for these larger firms.

We further explore this more flexibly in Figure 2, which shows coefficients from rolling regressions in the number of employees, which take approximately 30 percent of the sample at a time. For each subsample we regress the outcome on treatment and controls for the stratifying variables of baseline investment readiness score, country, and having a private investor at baseline. The results confirm the pattern above, whereby investment readiness scores improved only for the smaller firms, and they then subsequently were more likely to receive investment from outside sources.

This heterogeneity analysis suggests that the intervention did work for smaller firms, and that the null average effects comes from averaging this positive effect with much smaller, or even negative, impacts for larger firms. We conjecture that this impact comes from the program being particularly beneficial for the types of firms who would otherwise struggle to attract investor attention.[18] To investigate this idea further, we employ the endogenous stratification method of Abadie et al. (2018) to see whether the program worked better for firms with lower predicted likelihoods of making a deal with an investor over the two years in the absence of treatment.[19] This uses the control group to predict the likelihood of receiving an investment as a function of baseline characteristics, and uses either a leave-one-out or repeated split samples approach to avoid a small sample bias that can arise from observations contributing to their own estimated fitted values. Given the size of our sample, we then split by above or below the median predicted probability of funding in the absence of treatment.

[18] Note that the differential treatment impact does not come from differences in take-up rates by firm size: smaller firms were as equally likely to complete the Whataventure tool, attend masterclasses, and use a mentor as larger firms.

[19] This was also not pre-specified, since this is a new method that we were not aware of at the time of designing this experiment. It's use follows naturally as an exploration for the reason for heterogeneity by firm size.

Table 6 reports the results. We see that the investment readiness program is estimated to have a positive and significant impact on receiving external investment for those firms who otherwise would be in the bottom half of firms in our sample in terms of likelihood of receiving an investment. The magnitude is between 12.4 percentage points (repeated split samples approach) and 14.3 percentage points. In contrast, for firms in the top half of the likelihood of receiving an investment to begin with, the program had a negative and statistically insignificant effect. Appendix Table 10 uses the leave-one-out classification to compare baseline summary statistics of firms by this predicted likelihood of funding absent the intervention. We see that the firms that are helped more by the program tend to be smaller in size, are less likely to have received mentoring or acceleration before, have a less global focus, and are more likely to be run by less-educated founders and teams with at least one female founder than those with higher predicted likelihoods of funding that the program does not help.

7. Conclusions

Investment readiness programs have been offered in a range of developing and emerging markets, based on the idea of a gap between the quality of ideas entrepreneurs have, and their readiness to attract and receive outside investment in those ideas. Despite their growing use, there has not been any rigorous study of their effectiveness. Our five-country randomized trial enables measurement of the effect of such a program. We do find that investment readiness increases, as measured by scores in a pitch competition, and that these scores are in turn predictive of future investment readiness and outcomes amongst firms. Nevertheless, despite finding positive point estimates, our estimates of the treatment effects of the investment readiness program on these firm investment outcomes over the next two years are not statistically significant. Our analysis suggests that this modest average effect in part comes from more of the

firms being able to obtain financing without the program that was originally anticipated. Examining the heterogeneity of impacts, the program appears to have only succeeded in increasing investment readiness and the chance of subsequent external financing for smaller firms (those with 1 to 3 workers), and those which otherwise were less likely to receive external financing. We believe these results offer lessons for governments deciding whether and how to use such policies. They show that this type of program can be effective at helping smaller and less experienced firms close the financing gap, and suggests the need to carefully target these programs. A further area for policy experimentation is to test which components of the overall investment readiness program matter most, something our sample size prevented us from testing.

References

Abadie, Alberto, Matthew Chingos and Martin West (2018) "Endogeneous stratification in randomized experiments", *Review of Economics and Statistics* 100(4): 567-580.

Catalini, Cristian, Jorge Guzman and Scott Stern (2017) "Hidden in plain sight: venture growth with or without venture capital", Mimeo. MIT.

Chatterji, Aaron, Solène Delecourt, Sharique Hasan and Rembrand Koning (2018) "When Does Advice Impact Startup Performance?", *NBER Working Paper no. 24789.*

Clingingsmith, David and Scott Shane (2017) "Training Aspiring Entrepreneurs to Pitch Experienced Investors: Evidence from a Field Experiment", *Management Science*, advance online access.

Gattini, Luca, Dragan Soljan, Peter Hauser, Tatyana Dolgaya, Sorin Revenko, and Michael Kortenbusch (2016). *Assessment of financing needs of SMEs in the Western Balkans countries. Synthesis Report*. European Investment Banks.

Gompers, Paul, Will Gornall, Steven Kaplan and Ilya Strebulaev (2019) "How do Venture Capitalists Make Decisions?", *Journal of Financial Economics*, forthcoming.

Gonzalez-Uribe, Juanita, and Michael Leatherbee (2018) " The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile", *Review of Financial Studies* 31(4): 1566-1603.

Hallen, Benjamin, Christopher Bingham, and Susan Cohen (2014) "Do Accelerators Accelerate? A Study of Venture Accelerators as a Path to Success?", *Academy of Management Proceedings* 12955.

Holm, Sture (1979) "A simple sequentially rejective multiple test procedure", *Scandinavian Journal of Statistics* 6: 65-70.

Howell, Sabrina (2018) "Learning from Feedback: Evidence from New Ventures", Mimeo. NYU.

Imai, Kosuke, Luke Keele, Dustin Tingley, and Teppei Yamamoto (2011) "Unpacking the Black Box of Causality: Learning about Causal Mechanisms from Experimental and Observational Studies." *American Political Science Review* 105 (4): 765–89.

Kaplan, Steven and Per Strömberg (2004) "Characteristics, Contracts, and Actions: Evidence from Venture Capitalist Analyses", *Journal of Finance* 59(5): 2177-2210.

Karajkov, Risto (2009) *Bridging the Gap: Access to Risk Finance for Early-Stage SMEs in Southeast Europe*. http://www.incubat.ro/uploads/Publicatii_Investment_SMS_report.pdf

Lee, David (2009) "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects", *Review of Economic Studies* 76(3): 1071-1102.

Mason, Colin and Richard Harrison (2001) "Investment Readiness': A Critique of Government Proposals to Increase the Demand for Venture Capital", *Regional Studies*, 35(7): 663-668

Mason, Colin and Jennifer Kwok (2010) "Investment Readiness Programmes and Access to Finance: A Critical Review of Design Issues", *Local Economy* 25(4): 269-92.

McKenzie, David and Anna Luisa Paffhausen (2018) "Small Firm Death in Developing Countries", *Review of Economics and Statistics*, forthcoming.

McKenzie, David and Christopher Woodruff (2017) "Business practices in small firms in developing countries", *Management Science* 63(9): 2967-81.

McKenzie, David and Christopher Woodruff (2014) “What are we learning from business training evaluations around the developing world?”, *World Bank Research Observer*, 29(1): 48-82

Roland Berger (2019) *Revisiting the market for innovation: How accelerators and incubators can reinvent themselves.* https://www.rolandberger.com/publications/publication_pdf/roland_berger_revisiting_the_market_for_innovation.pdf [accessed June 15, 2019]

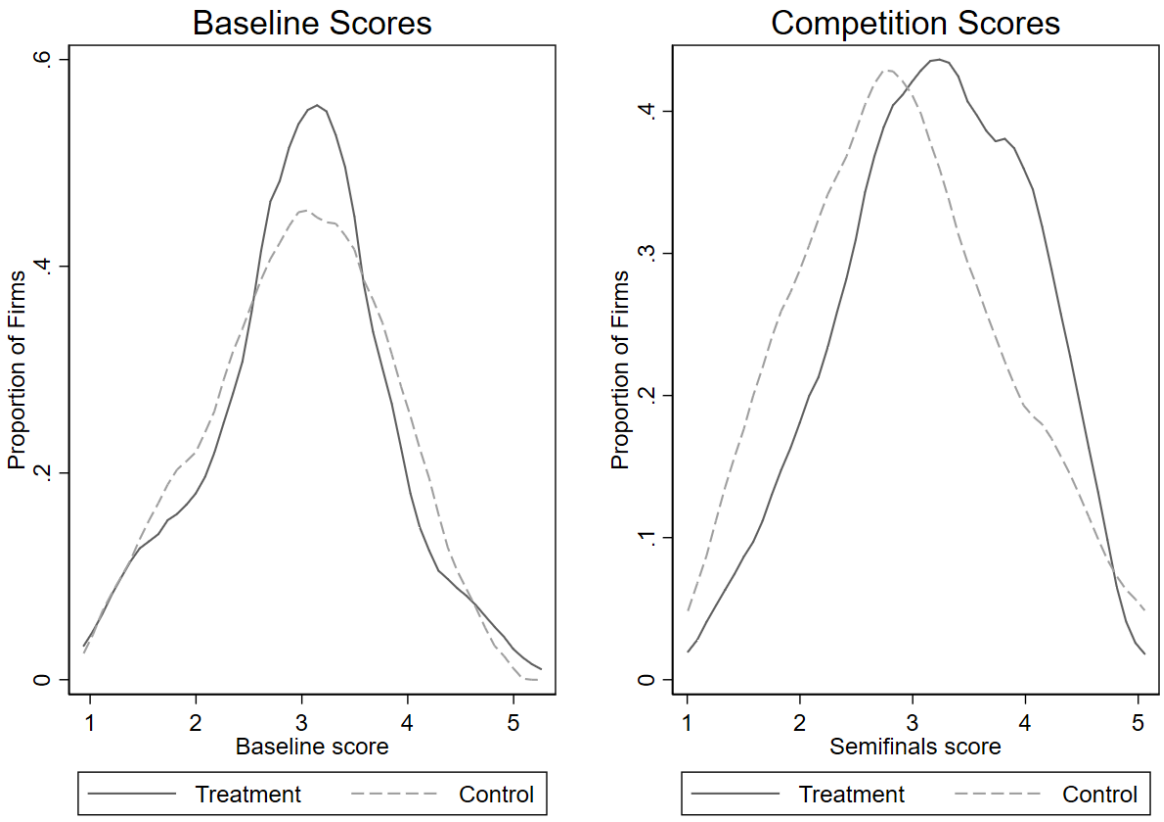
Smith, Sheryl Winston, and TJ John Hannigan (2015) “Swinging for the fences: How do top accelerators impact the trajectories of new ventures?”, http://druid8.sit.aau.dk/druid/acc_papers/5ntuo6s1r5dvrpf032x24x5on5lq.pdf

Vizjak, Ana and Maja Vizjak (2016) “Activities of Business Angels in Croatia”, *Journal of US-China Public Administration*, 13(1): 16-25

Wagner, Rodrigo (2017) “Does Feedback to Business-Plans Impact New Ventures? Evidence from a Field Experiment”, Available at SSRN: http://ssrn.com/abstract=2766566

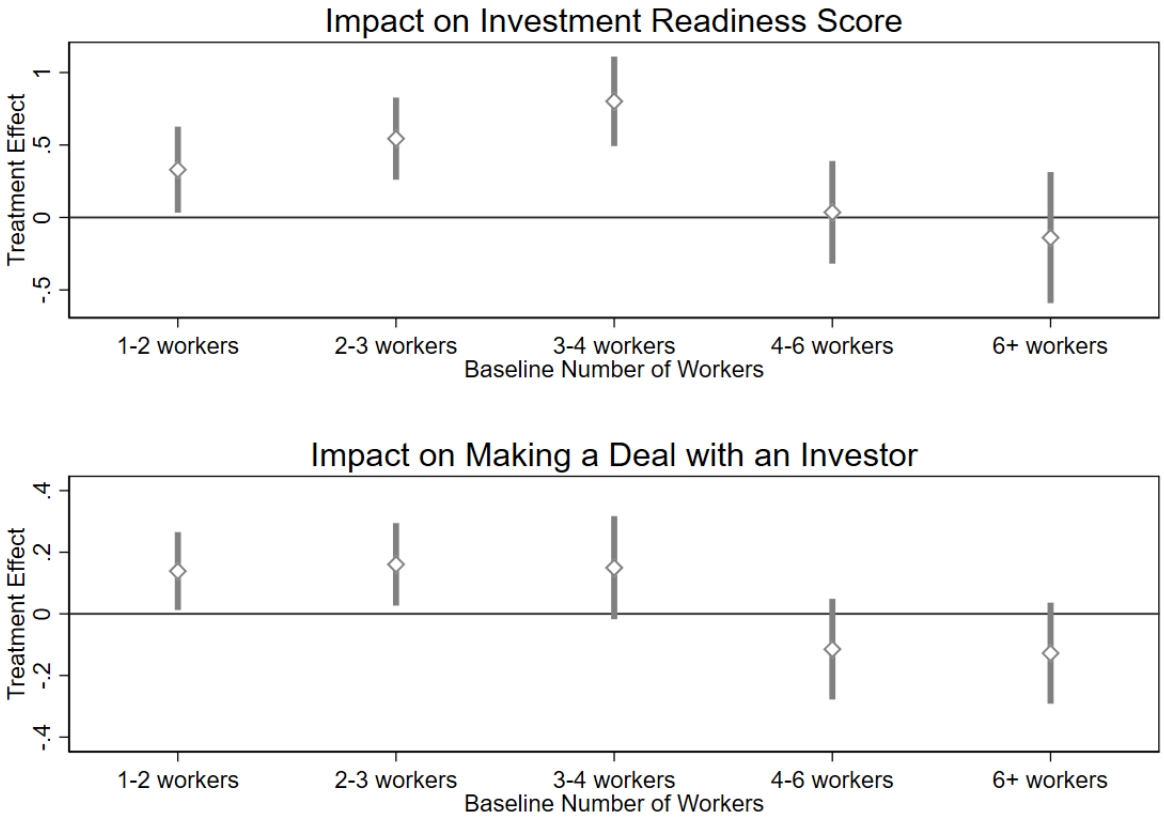
Yu, Sandy (2016) “How do Accelerators Impact High-Technology Ventures?”, *Management Science*, forthcoming.

Figure 1: Distributions of Baseline and Post-Intervention Competition Investment Readiness Scores by Treatment Status



Notes: Baseline scores are for the subset of firms that attended the semi-finals. Competition scores are post-treatment. Kolmogorov-Smirnov test of equality of distributions has p-value of 0.959 at baseline and 0.017 post-intervention.

Figure 2: The Impact of the Program is Higher for Firms that were Small at Baseline



Notes: Graphs show point estimates from rolling regressions which estimate the impact of being assigned to treatment for rolling samples of approximately 30 percent of the sample at the time, conditioning on the stratifying variables of initial investment readiness score, country, and whether or not the firm had a private investor to begin with. 90 percent confidence intervals shown around point estimates.

Table 1: Descriptive Statistics and Balance Test on Application Data

	Full Sample			Semi-Final Participants		
	Treatment	Control	P-value	Treatment	Control	P-value
Variables stratified on						
Incorporated/Registered in Croatia	0.25	0.24	0.612	0.25	0.30	0.920
Incorporated/Registered in Serbia	0.46	0.46	0.626	0.48	0.48	0.513
Baseline Readiness Score	2.95	2.92	0.150	2.99	2.97	0.476
Has an outside private investor	0.10	0.09	0.178	0.14	0.06	0.170
Other variables						
Market attractiveness score	3.08	3.05	0.851	3.13	3.18	0.579
Product technology score	2.47	2.43	0.835	2.56	2.71	0.085
Traction score	3.34	3.27	0.507	3.28	3.06	0.382
Team score	3.04	3.05	0.878	3.08	3.02	0.207
Sector is business and productivity	0.48	0.39	0.107	0.45	0.36	0.436
Sector is lifestyle and entertainment	0.18	0.23	0.295	0.20	0.27	0.215
Uses Cloud Technology	0.20	0.26	0.231	0.20	0.21	0.984
Uses Big Data	0.18	0.21	0.642	0.17	0.20	0.915
Place in value chain is developer	0.61	0.55	0.171	0.60	0.57	0.677
Place in value chain is service provider	0.59	0.54	0.372	0.60	0.54	0.108
Age of firm (years)	2.61	2.66	0.887	2.24	2.29	0.346
Early stage firm	0.30	0.33	0.475	0.35	0.37	0.554
Revenues in 2014	178073	184760	0.959	37642	144012	0.303
Number of employees	6.47	5.88	0.539	4.65	5.32	0.800
Age of main founder	38.22	36.81	0.204	38.02	36.67	0.362
Main founder has post-graduate education	0.49	0.48	0.816	0.54	0.55	0.740
At least one founder is female	0.16	0.22	0.128	0.16	0.30	0.071
Company has a global focus	0.60	0.58	0.576	0.59	0.63	0.569
Have accepted outside financing	0.34	0.37	0.656	0.42	0.40	0.836
Previously in mentoring/accelerator program	0.15	0.16	0.704	0.18	0.22	0.202
Sample Size	**174**	**172**		**110**	**101**	
Joint test of orthogonality of treatment p-value			0.621			0.086

Notes: Full sample denotes the full experimental sample. Semi-final participants are the sample that were scored by judges during the semi-final pitch event. Variables stratified on were the variables used in randomized assignment.

Table 2: Impact of Program on Investment Readiness as Scored by Judges

	Overall Readiness Score	Components of the Overall Score					Presentation Score	Selected to go to Finals	Std Dev of Judge Scores
		Team Score	Technology Score	Traction Score	Market Score	Progress Score			
Base Specification									
Assigned to Treatment	0.284**	0.167	0.372**	0.206	0.268*	0.373***	0.372**	0.115*	0.006
	(0.126)	(0.150)	(0.152)	(0.130)	(0.137)	(0.137)	(0.164)	(0.068)	(0.049)
Including Judge Fixed Effects									
Assigned to Treatment	0.409***	0.369**	0.476***	0.295**	0.463***	0.440***	0.514***	0.090	-0.017
	(0.135)	(0.158)	(0.174)	(0.142)	(0.139)	(0.143)	(0.191)	(0.076)	(0.051)
Sample Size	211	211	211	211	211	211	211	211	211
Control Mean	2.908	3.042	2.970	2.541	3.406	2.794	3.042	0.122	0.723
Control Std. Dev.	0.903	1.068	1.031	0.947	0.940	0.937	1.145	0.328	0.317

Notes:

Robust standard errors in parentheses. Regressions control for randomization strata. *, **, *** indicate significance at the 10, 5, and 1 percent levels respectively. Judge fixed effects controls for which five of the sixty-five judges judged a particular firm.

Table 3: Impacts on Firm Outcomes 6 months and 2 years after program

	Media Buzz	Firm survival	Interested in equity	General Investability	Specific needs of investors	Investment Steps	External investment	Made a deal with investor
Panel A: Impact at Six Months								
Assigned to Treatment	0.085	0.049	0.051	0.026	0.082	-0.017	-0.152*	-0.024
	(0.053)	(0.030)	(0.094)	(0.085)	(0.080)	(0.098)	(0.087)	(0.033)
Sample Size	346	319	278	277	269	240	279	279
Control Mean	-0.060	0.898	-0.015	-0.039	-0.059	0.008	0.084	0.083
Control S.D.	0.546	0.303	0.764	0.634	0.682	0.720	0.741	0.276
Panel B: Impact at Two Years								
Assigned to Treatment	0.112**	0.072	0.032	0.089	0.084	0.044	0.003	0.050
	(0.047)	(0.045)	(0.084)	(0.082)	(0.079)	(0.092)	(0.080)	(0.049)
Sample Size	346	340	309	291	298	282	330	330
Control Mean	-0.073	0.753	-0.005	-0.058	-0.059	-0.032	0.018	0.244
Control S.D.	0.528	0.433	0.783	0.650	0.692	0.760	0.698	0.431

Notes: robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.
All regressions control for randomization strata fixed effects.

Media Buzz is a standardized index of whether the firm is mentioned in the media, the number of media mentions, number of Facebook likes and number of Twitter followers. **Firm survival** is a binary variable that takes value one if the firm is operating, and zero otherwise. **Interested in equity** is a standardized index of whether the firm is interested in equity financing, the maximum equity share they are willing to have owned by outside investors, whether they have specific deal terms for investors, and whether they would consider a royalty- based investment. **General investability** is a standardized index of number of employees, whether the founders work full-time in the business, whether the firm had positive sales in the first quarter of the year, whether total sales exceed 10,000 euros in that quarter, whether the firm made a positive profit in the past year, and whether the firm made sales to Western Europe or the United States. **Specific needs of investors** is a standardized index of whether business and personal accounts are separated, whether the firm has made a revenue projection for the next year, whether it knows customer acquisition costs, the number of key metrics tracked, whether it has found out if the product or service can be covered by intellectual property protection, and whether it has at least one form of intellectual property protection received or pending. **Investment steps** is a standardized index of having contacted at outside investor, made a pitch to an outside investor, have a mentor or external expert supporting them to obtain financing, and entered into negotiations with an outside investor. **External investment** is a standardized index of having taken on new debt, having made a deal with an outside investor, have received at least 25,000 euros in outside financing, and have received an incubator or accelerator grant (all since August 2015). **Made a deal with an investor** indicates having made a deal with an outside investor since August 2015 (program start).

Table 4: Judges Scores Predict Firm Outcomes 6 months and 2 years after program

	Media Buzz	Firm survival	Interested in equity	General Investability	Specific needs of investors	Investment Steps	External investment	Made a deal with investor
Panel A: Association at Six Months								
without controls	0.261***	0.024	0.201**	0.076	0.336***	0.222***	0.213**	0.093**
Score assessed by Judges	(0.057)	(0.037)	(0.076)	(0.072)	(0.065)	(0.082)	(0.098)	(0.038)
with controls for country, prior funding, sector, firm age and stage, founder gender and education, baseline employment								
Score assessed by Judges	0.220***	0.017	0.209**	0.080	0.296***	0.155	0.190*	0.080**
	(0.052)	(0.042)	(0.099)	(0.080)	(0.078)	(0.103)	(0.113)	(0.037)
Sample Size	101	92	83	83	81	73	82	82
Control Mean	-0.060	0.898	-0.015	-0.039	-0.059	0.008	0.084	0.083
Control S.D.	0.546	0.303	0.764	0.634	0.682	0.720	0.741	0.276
Predicted Treatment Effect	0.073	0.007	0.056	0.021	0.094	0.062	0.060	0.026
Panel B: Association at Two Years								
without controls	0.271***	0.061	0.153*	0.040	0.136*	0.322***	0.322***	0.166***
Score assessed by Judges	(0.059)	(0.041)	(0.088)	(0.073)	(0.082)	(0.100)	(0.072)	(0.048)
with controls for country, prior funding, sector, firm age and stage, founder gender and education, baseline employment								
Score assessed by Judges	0.232***	0.079	0.153	0.061	0.128	0.331***	0.333***	0.163***
	(0.053)	(0.049)	(0.097)	(0.082)	(0.086)	(0.103)	(0.081)	(0.051)
Sample Size	101	100	92	86	88	80	99	99
Control Mean	-0.073	0.753	-0.005	-0.058	-0.059	-0.032	0.018	0.244
Control S.D.	0.528	0.433	0.783	0.650	0.692	0.760	0.698	0.431
Predicted Treatment Effect	0.076	0.017	0.044	0.011	0.038	0.090	0.090	0.046

Notes: robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.
Predicted Treatment effect is the treatment effect predicted from association in the control group between the judges score and the outcome, multiplied by the treatment effect of the program on the judges score.
Outcomes are as defined in Table 3.

Table 5: Heterogeneity in Impacts by Initial Firm Size

	Investment Readiness Score	Impacts over Two Years							
		Media Buzz	Firm survival	Interested in equity	General Investability	Specific needs of investors	Investment Steps	External investment	Made a deal with investor
Assigned to Treatment	0.474***	0.157**	0.112	0.071	0.034	0.081	0.217	0.194*	0.156**
	(0.172)	(0.080)	(0.071)	(0.127)	(0.112)	(0.122)	(0.142)	(0.108)	(0.071)
Assigned to Treatment*Median size or higher	-0.450	-0.056	-0.087	-0.073	0.110	0.005	-0.338*	-0.389**	-0.212*
	(0.291)	(0.133)	(0.108)	(0.193)	(0.188)	(0.187)	(0.203)	(0.192)	(0.113)
Median size or higher	0.422*	0.184*	0.145*	-0.001	0.250*	0.159	0.135	0.372***	0.165**
	(0.216)	(0.098)	(0.081)	(0.153)	(0.137)	(0.144)	(0.163)	(0.125)	(0.081)
Sample Size	211	346	340	309	291	298	282	330	330
Control Mean Small Firms	2.683	-0.207	0.701	-0.052	-0.217	-0.140	-0.109	-0.174	0.143
Control Mean Larger Firms	3.198	0.065	0.807	0.044	0.106	0.021	0.045	0.219	0.350

Notes:

Median Size or higher is a dummy variable taking value one if the firm has at least the median number of baseline workers, and zero otherwise.

Investment Readiness Score is Score as assessed by Judges

Robust Standard Errors in parentheses, *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.

Outcomes are taken from two year follow-up survey, and are two years post-intervention.

Table 6: Heterogeneity in Treatment by Predicted Likelihood of Making a Deal with an Investor

	Impact on Making a Deal within 2 years	
	Leave-one-out estimator	Repeated Split-Sample Estimator
Low Predicted Likelihood of Funding	0.143**	0.124**
	(0.066)	(0.055)
High Predicted Likelihood of Funding	-0.081	-0.049
	(0.079)	(0.074)

Notes: Bootstrap standard errors, based on 500 bootstrap replications, are reported in parentheses.
*, **, *** denotes significance at the 10, 5, and 1 percent levels respectively.
The repeated split-sample estimator uses 200 splits of the data.
Predicted likelihood of funding based on the following baseline characteristics:
Employment above the median, initial investment readiness score, country, whether the firm has had a private investor, whether it classifies itself as early stage, sector, firm age, whether the main founder has post-graduate education, whether at least one founder is female, and whether the firm has previously received mentoring. Abadie et al. (2018) endogenous stratification approach used.

ONLINE APPENDICES

Appendix 1: Examples of Investment Readiness Programs Around the World

Appendix 2: Timeline

Appendix 3: Scoring Methodology and Variable Definitions

Appendix 4: Additional Details on Treatment Intervention

Appendix 5: Additional Details on Control Intervention

Appendix 6: Additional Details on the Semi-Finals and Finals

Appendix 7: Benchmarking against other program participants

Appendix 8: Follow-up Survey Completion Rates and Balance

Appendix 9: Treatment Effects on Individual Survey Outcomes

Appendix 10: Comparison of Firms with Low and High Likelihood of Funding

Appendix 1: Examples of Investment Readiness Programs around the World

A global database of investment readiness programs does not appear to exist, preventing us from calculating the global reach of such programs in terms of total amount spent or total number of firms served. Mason and Harrison (2001) and Mason and Kwok (2009) provide reviews of some of the earlier programs. These programs have now expanded to be used in a wide range of countries, as the following examples illustrate:

Australia

- The Difference Incubator Investment Readiness Program

Website: https://tdi.org.au/investment-readiness-program/
The Difference Incubator supports social enterprises for a period of around 12-18 months mainly educating them about impact investment and brokering relationships with potential investors willing to invest $500k or more, while giving advice to develop documentation and agreements with them. They also train enterprises on aspects like the business model or the impact reporting methodology.

- Impact Investment Ready Growth Grant

Website: https://impactinvestmentready.com.au
This program is funded by the Australian Government Department of Social Services, and is intended to help impact businesses and mission-driven organizations to secure investments. It offers grants that can pay for help with activities such as preparing term sheets and legal documentation, financial modelling, and is accompanied by introductions to investors. The program has spent almost A$2million supporting 33 organizations to date.

Canada

- Ontario Procurement and Investment Readiness Fund

Website: https://www.ontario.ca/page/procurement-and-investment-readiness-fund
This program consists of a $6 million fund by the Ministry of Economic Development, Job Creation and Trade of Canada. It provides access to tailored business support to growing Ontario-based social enterprises looking to compete for procurement and investment opportunities, in both the government and the private sector. This includes providing grants, partnering with relevant service providers (consultants, legal services etc.) and connecting enterprises to investors.

Central and Eastern Europe

- Investment Ready Program

Website: http://investment-ready.org
Investment Ready is geared to ventures from Central and Eastern Europe with a social impact and a scalable model. They have supported 91 firms to date, through 4-month training programs on business strategy and investment readiness. The program involves mentors, content experts and investors and provides access to a large network with stakeholders and investors coming from all over the world - angel investors, funds, banks.

- Getting Ready for Capital (GReaC)

Website: http://greac.eu
This program, funded by the EU, aimed to help entrepreneurs in Bulgaria, Poland, and Belgium to understand the private equity market and to effectively present their business propositions to investors.

Denmark

- Copenhagen Spin-outs Program at the University of Copenhagen

Website: http://www.copenhagenspin-outs.dk/en

Copenhagen Spin-outs is an initiative that lets the academic research environment meet industry with a focus on innovation and commercialisation of biotech research in the capital region area. From 2012 to 2015 it was funded with 40 million DKK. Today it is funded only by partners, but it keeps involving mentors, potential investors and industrial partners to develop technologies and build investment ready business strategies through courses, workshops and seminars.

East Africa

- Elevate Investment Ready Program

Website: https://1millionstartups.co.ke/index.php/elevate-investment-ready-program/

1Million Startups East Africa launched this project to help entrepreneurs review their business model, build their growth strategy and a credible investment case and financial planning with the aim of making their start-ups investment ready. The initiative has a focus on social impact and on the alignment of businesses with the SDGs. It offers a 3 modular intense program with personalised support by entrepreneurs, mentors, investors and content experts, involving pitch practicing, financial planning, stakeholders structure reviewing, term sheet creation and so on.

- PACE Investment Readiness Program

Website: http://opencapitaladvisors.com/pace-investment-readiness-program/

This 2 years program has supported around 60 high potential early-stage businesses until today in collaboration with USAID. They offer a customised service including business support such as market sizing, operational optimization, strategy development, but also help with the due diligence process for supported companies.

International

- Seedstars Investment Readiness Program

Website: https://www.seedspace.co/en/offers/investment-readiness-program/

This is an entirely online program and it is the first Artificial Intelligence powered investment program: it is completely customisable for each start-up - meaning that the time frame can vary between 1 month up to 24 months, and the contents can vary as well according to the specific business. It has been developed to boost tech start-ups investment readiness and it is leveraged by Seedstars, which claims to be the world's leading network of tech entrepreneurs in emerging markets. Training and mentoring sessions from experts and investors, together with curated insights, are offered based on the specific data of the businesses.

- Ground-up

Website: https://www.groundupproject.net/about-us

They offer an investment readiness questionnaire, and investment clinics designed to prepare impact ventures for fundraising through a mixture of webinars, investor lectures, and tailored one-on-one support. Their focus is on impact ventures looking for under $20 million in funding.

- Invite "Improve your Investment Readiness" Competition

Website: https://invite-project.eu

This project is a three year Horizon 2020 innovation action co-funded by the Horizon 2020 Research and Innovation Programme of the EU. The overall budget is almost 3 million euros. The initiative takes

around 9 months and is aimed to improve investor-readiness of SMEs by improving their business plan, training them on pitching capacities and by producing a professional video that can help them to remotely engage with potential investors.

- Invest Horizon

Website: https://investhorizon.eu
This program is a large scale project funded by the European Commission in association with Eureka, planning to support up to 500 companies to attract investment in next 2 years. They enrol start-ups in programs that may take 8 to 12 months long including boot camps, workshop, pitching events, but also online courses and webinars, as well as networking opportunities.

- World Business Angels Investment Forum Investment Readiness Program

Website: http://wbaforum.org/investment-readiness-for-entrepreneurs-start-ups-and-sme-executives/index.html
This program is an intensive 3 days course aiming to introduce SMEs and start-ups to several forms of external financing. It includes training on the equity raising process, on the business model and on term sheets, and also involves round tables with potential investors and a pitching session.

- The Next Society Innovators Academy (European Business Angels Network)

Website: https://www.thenextsociety.co/innovators-academy
The Next Society started an action plan of 4 years (2017-2020) co-financed by the European Union (90%) for a total budget of €7,8 million and it already involved 2500 SMEs from around 30 countries. It organises the Innovators Academies, events that can take up to 5 days and offer the possibility for tech and innovative SMEs to get feedback from angel investors and VCs on their business plan, to pitch during a workshop and to get individual coaching on investment readiness. Moreover, they offer specific training on intellectual property rights and innovation management.

Ireland

- Enterprise Ireland Irish High-Potential Start-Up (HSPU) scheme

Website:https://www.taftie.org/sites/default/files/IPF%20Peer%20Review%20Report%20High%20Potential%20Start-Ups_0.pdf
Enterprise Ireland approved funding to support several hundreds of High-Potential Start-Ups from 2009 to today. After a discussion of the business idea, a Development Advisor works with every start-up company preparing an "Investor Ready Business Plan" that specifically reports market opportunity, the product or service that is offered, the business model, the human resources, the targets, and the funding. The Advisor can both offer advice and consider various grant supports; he or she is supported also by a Commercial Evaluator, Technical Assessor and Investment Adviser for the final Business plan.

Morocco

- Investment Readiness Support Program for Moroccan Climate Entrepreneurs.

Website: https://nl4worldbank.org/2019/01/08/ec2-investment-readiness-support-program-for-moroccan-climate-entrepreneurs/
This is a program starting in 2019 that will provide investment readiness support to cleantech entrepreneurs in Morocco, being funded by the IFC.

- Financing Innovative Start-ups Project

Website: http://documents.worldbank.org/curated/en/805641489370466662/pdf/Morocco-Financing-Innovative-Startups-PAD1362-02222017.pdf

This project of the World Bank plans to support ecosystem providers to deliver mentoring and investment readiness programs to approximately 100 entrepreneurs.

New Zealand

- New Zealand Trade & Enterprise Investment Readiness Program

Website: https://www.nzte.govt.nz/our-services/investment-readiness

The New Zealand Government funds this initiative that performs specific training on customer acquisition and business models while helping SMEs and start-ups to connect with international and domestic investors after having stress tested the proposition. Firms are trained to draw a clear capital roadmap, find their sustainable unique development goal and find capital in the following 6-12 months.

Romania

- Romanian Innovation Commercialization Assistance Program (RICAP)

Website: http://portal.larta.org/ricap

This program worked with 30 technology innovators to help them address commercialization needs and develop go-to-market strategies. It used both US-based advisors and local mentors to help firms commercialize and to connect to a network of global investors.

Rwanda

- USAID SME Investment Readiness Workshop Series Launch

Website: http://www.ngurizanshore.rw/latest-news/article/sme-investment-readiness-workshop-series-launch

This program funded by USAID supported around 90 firms with a focus on exposing on financing options and on the particular features of the SME that make it better for different forms of financing. Extensive feedback is given by angel investors, venture capital funds, impact investors.

South Africa

- AWIEF Growth Accelerator

Website: https://www.awieforum.org/2019-awief-growth-accelerator-programme/

This program is focused on social enterprises and includes three different stages: the first one is an online procedure that includes sending a teaser and a pitch deck to the platform and take the test to assess investment readiness. The second stage offers investor webinars and support in preparing Impact Ventures for fundraising and getting webinars. In the third stage you get a personalised assessment & analysis.

Tanzania

- Anza Investment Readiness Accelerator for Social Enterprises

Website: http://anza.co.com/investment-readiness/

This initiative is specifically designed to support entrepreneurs with a tangible social impact in the country. It includes a series of workshops - normally they are 4-day engagements - offering training on business models, pitching sales pipelines and other aspects. The initiative also offers one-to-one time with mentors, industry experts, investors.

United Kingdom

- Invest East Investment Readiness Program

This programme supports Norfold and Suffolk businesses preparing them to raise equity and other firms of finance. SMEs are trained on a 3 to 5 month process that schedules several workshops and includes

one-to-one work with the key advisor and mentors. They are partly funded by the England European Regional Development Fund (ERDF) as part of the European Structural and Investment Funds Growth Programme which started in 2014.

- University of Central Lancashire Investment Readiness Program

Website: https://www.uclan.ac.uk/business_at_uclan/investment-readiness.php
This program provides investment readiness guidance and several support activities, included pitching sessions and business plan and strategy reporting. They offer an overview of private and institutional investors and different investment processes. The process counts 3 main sections including training on external financing possibilities, improving investment readiness of the firm and one-to-one pitch coaching and development sessions

- Investment and Contract Readiness Fund

Website: https://www.gov.uk/government/news/investment-and-contract-readiness-fund-helps-social-ventures-win-business-worth-117-million,
The Investment and Contract Readiness Fund (ICRF) is a three-year £10 million (US$ 15.2 million) fund that supported 51 charities and social enterprises. The initiative helps social enterprises to acquire the needed skills to raise investment and compete for public service contracts, which is a big black hole.

- Westminster Impact Hub Investment Readiness Program

Website: https://westminster.impacthub.net/2015/04/13/ready-impact-investment/
This program is funded by the European Union: it is a two-day course. The investment readiness program aims to accelerate investment. The first step is understanding which is the type of external investment is right for the firm, the second is discovering the best way to build a business model; and the third, helps to articulate the mission of the firm as an attractive impact investment.

- Growth Accelerator

Website:
https://webarchive.nationalarchives.gov.uk/20160105123043/http://www.ga.businessgrowthservice.greatbusiness.gov.uk/what-we-offer/access-to-finance/
This large scale project funded by the European Union (European Regional Development Fund 2007-13) with a budget of around 200£ million programme engaged 18,000 business in total. It is focused on SMEs that need to access several forms of external funding - like equity - and in particular it includes different steps: understanding which type of finance is most suitable, writing the business plan and putting down the investment pitches. The program involves a combination of masterclasses and mentoring sessions.

- Newable (formerly London Business Angels)

Website: https://newable.co.uk
Newable Limited provides finance, consulting, and property services for start-ups, and small and medium-sized businesses. It offers mentoring services, business expansion services, data protection and cyber security, regulatory compliance and other consulting services.The company also provides various networking opportunities, the possibility to participate to overseas trade fairs and targeted programs of intensive one-to-one support with access to private finance advice.

Mason and Kwok (2010) also provide details on several other programs in the U.K. These include different variants of investment readiness programs tried by the U.K. Small Business Service's

Investment Readiness Demonstration Project, and the University of Warwick's Science Park's Investment Readiness program.

United States

- Steve Blank's Lean Start-up Method

Website: http://steveblank.com/about

This offers entrepreneurs a framework to focus on what is important to be ready, and tools that allow start-ups to focus on key parts of an early-stage venture that matter most for investors: product, market fit, customer acquisition, revenue and cost models, channels, and partners, so that they can be ready to present business propositions to potential investors.

- Larta Institute

Website: http://www.larta.org/

The offer several investment readiness programs and services, working with entrepreneurs to help them to be ready to raise equity finance. This includes a mixture of workshops, mentoring, webinars, learning modules, market connections, and introductions to industry experts. In one program, they worked to help National Science Foundation grantees in the Small Business Innovation Research program to develop Commercialization Plans.

- NexusLA

Website: https://www.nexusirp.com/

This program focuses on high-potential early-stage businesses in Louisiana. It offers one-on-one coaching to help firms make the proper preparations to receive funding from investors, angels, and venture capitalists, as well as connections to a network of investor groups.

Western Balkans

- EU4Tech Investor Readiness Program

Website: https://eu4tech.eu/investor-readiness-program-2019/

This 6 weeks program offers to all the participants personalised face-to-face and remote coaching from a specific mentor, and will make them able to attend specific workshops related to external sources of funding for innovative tech firms. This program already supported around 35 firms. It is supported by the European Union.

Appendix 2: Timeline

Aug 14, 2015: applications launched

August 2015: roadshows, advertising

Sept 6, 2015: Applications closed

Sept 10, 2015: Random assignment done by computer

Oct 2, 2015: Registration in AEA RCT registry

Sept 10-Nov 13, 2015: Investment Readiness program implemented, master classes, mentoring, etc.

November 12-14, 2015: Semi-finals and pitch event in Belgrade

December 2-4, 2015: Finals with the top 54 firms from the semi-finals pitching in front of the investors VC fund managers and Business Angels.

April-August 2016: First follow-up survey (approximately 6 months post-program)

August 2017-March 2018: Second follow-up survey (approximately 2 years post-program).

Appendix 3: Scoring and Data Appendix

The key variables are measured and defined as follows:

Baseline Investment Readiness

The applications were scored by a team from Pioneers Ventures, a seed-stage venture capital investment unit. Two professional investment managers reviewed each eligible application independently and assigned a score, based on for sub-scores using an agreed scoring metric as detailed below in Appendix Table 3.1. Where the independent scores differed by more than one unit, they discussed the cases to arrive at a consensus score, otherwise the scores were averaged. Each business was scored on four sub-components as follows:

Appendix Table 3.1: Description of the Investment Readiness Scoring Scale

Category	*Weight*	*Points*	*Threshold description*
Market attractiveness	**10%**	1	Market does not exist/ no market need
		2	Small market well served by competitors or equally good substitutes
		3	Large market well served by competitors or equally good substitutes
		4	Attractive niche in small market with unique solution/ positioning
		5	Attractive niche in large market with unique solution/ positioning
		6	Very large and mostly untapped/ underserved market with right offering

Co-founder(s) and team	**20%**	1	Single founder, no team
		2	Team of 2+ people
		3	Complimentary team with little experience
		4	Complimentary team with significant experience
		5	Serial entrepreneur(s)
		6	Serial entrepreneur(s) with exit
Product/ technology	**30%**	1	No/ low innovation - Imitation of existing products or services
		2	Low innovation - Localization of proven business models from abroad
		3	Some innovation - Incremental improvements of existing products or services
		4	Innovative new solutions or business models that address customer needs
		5	Competitive technological innovation/ advantage
		6	Patented/ patent-pending technological innovation or otherwise protected IP
Traction	**40%**	1	No traction
		2	Soft traction (press coverage, facebook likes etc.)
		3	Test users/ prototype testing
		4	Non-financial KPIs (e.g. downloads, pre-orders)
		5	Generating revenues
		6	Sustainable business (generated revenues in 2014 > GPD/capita for each founder)

The *baseline investment readiness score* was then calculated as a weighted average of these four sub-components, using the weights detailed above.

Semi-finals scores provided by Judges

Judges scored each of the following on a six-point scale, with the score being the simple average of the scores of each of the five judges scoring the pitch:

1. *Team:* a score for the skills and capabilities of the entrepreneur and team
2. *Technology:* a score for the degree of innovativeness and technological advancement
3. *Traction:* a score for indications of measureable market success
4. *Market:* a score for commercial market attractiveness
5. *Progress:* a score for recent business development progress (in the last 3 months)
6. *Presentation:* a score for the presentation performance.

The following two variables were then calculated:

Overall readiness score: this is calculated as a weighted average of the team (28% weight), technology (21% weight), traction (14% weight), market (7% weight), and progress (30% weight) scores.

Std dev of judge scores: the overall readiness score is calculated for each judge. We then calculate the standard deviation of the five judge scores for a firm to get this measure of how much disagreement amongst judges there was in the scoring.

Finally, we also construct a dummy variable *Selected to go to Finals* to denote whether or not the firm was selected by virtue of having a top overall score or by direct nomination to go through to the Finals event.

Media mentions and social media buzz

The media intelligence specialist firm Meltwater was contracted to collect online media mentions of the firms in our sample over the six month period March 1 to August 31, 2015 (pre-intervention), and then one year and two years later (March 1 to August 31, 2016; and March 1 to August 31, 2017). Note that these time periods exclude the period of the intervention, semi-finals, and finals, so are independent of any media coverage of the program or pitch events, and correspond to an average of 6 and 18 months post-intervention. Meltwater tracks more than 250,000 global news sources in 190 countries in 25 languages (including Serbo-Croatian and Albanian).

Any media mention is a dummy variable that takes value one if the firm is mentioned in any of the over 250,000 global news sources covered by Meltwater during the six month period March 1 to August 31. This is measured for 2016 in panel A of Table 5, and for 2017 in panel B.

Number of media mentions: the number of times the firm is mentioned in any of the global news sources covered by Meltwater during the six month period March 1 to August 31. This is winsorized at the 99th percentile to reduce the influence of outliers.

 # Facebook likes: the number of likes for the firm's Facebook page, measured approximately 6 months and 18 months post intervention. This is recorded as zero for firms without Facebook pages (including firms that have closed down), and is winsorized at the 99th percentile.

 # Twitter followers: the number of followers the firm's twitter account has, measured approximately 6 months and 18 months post intervention. This is recorded as zero for firms without twitter profiles (including firms that have closed down), and is winsorized at the 99th percentile.

Media buzz index: Standardized z-scores of each of the above four variables are obtained by subtracting their mean and dividing by their standard deviation (separately by time period). The media buzz index is then the mean of the standardized z-scores for any media mention, number of media mentions, # facebook likes, and # twitter followers.

Survey outcomes

Firm survival: this is a dummy variable coded as one if the firm is still operating (regardless of whether or not it has the original owners), and 0 otherwise.

Interested in equity: this is an average of standardized z-scores from the following variables:

- *Interested in equity financing for the business:* a dummy variable which takes value one if the owners says they are interested in receiving new equity financing for the business.
- *Maximum equity share willing to have held by outside investors:* this variable ranges from 0 to 100, and is the percent of equity the firm owner reports being willing to have held by an outside

investor. It is coded as 100 for individuals who have sold their whole firm, and as the share of equity currently held by investors for those who are not interested in receiving new equity.

- *Have specific deal terms of offer outside investors:* this is a dummy variable, coded as one if the firm owner reports having specific deal terms (e.g. a draft term sheet) to offer outside investors, and zero otherwise. It is coded as zero for firms that have closed.
- *Would consider a royalty-based investment:* a dummy variable, coded as one if the firm owner reports willingness to consider a royalty-based investment, and zero otherwise. It is coded as zero for firms that have closed.

General investability: this is an average of standardized z-scores of the following variables:

- *Number of employees in the company:* the number of employees in the company, coded as zero for firms that are closed, and winsorized at the 99th percentile.
- *Founder/co-founders work full-time in the company:* a dummy variable that takes value one if at least one of the founders works full-time in the company, and zero otherwise.
- *Positive total sales for first quarter:* this is a dummy variable which takes value one if the firm made positive sales in the first quarter of 2016 (first follow-up survey), or in the first quarter of 2017 (second follow-up survey), and zero otherwise. It is coded as zero for firms that have closed.
- *Total sales for first quarter of at least 10,000 euros:* a dummy variable which takes value one if the firm made sales of at least 10,000 euros in the first quarter of 2016 (first follow-up survey), or in the first quarter of 2017 (second follow-up survey), and zero otherwise. It is coded as zero for firms that have closed.
- *Business made positive profit in last year:* a dummy variable which takes value one if the firm made a positive profit in 2015 (first follow-up survey) or in 2016 (second follow-up survey), and zero otherwise. It is coded as zero for firms that are closed.
- *Sales made in Western Europe or U.S.:* a dummy variable which takes value one if the firm makes sales in European Union countries (excluding Croatia and Slovenia) or in the United States, and zero otherwise. It is coded as zero for firms that are closed.

Meeting the specific needs of investors: this is an average of standardized z-scores of the following variables:

- *Accounts of the business are separated from those of the owners:* a dummy variable that takes value one if the business accounts are kept separately from those of the owner, and zero otherwise. It is coded as zero for closed firms.
- *Revenue projection made for the next 12 months:* a dummy variable that takes value one if the firm has in place a revenue projection for the next 12 months, and zero otherwise. It is coded as zero for closed firms.
- *Business knows customer acquisition costs:* a dummy variable that takes value one if the firm knows the cost of acquiring a customer, and zero otherwise. It is coded as zero for closed firms.
- *Number of key metrics (out of 11) being tracked:* the number of key metrics being tracked such as newsletter sign-ups, pre-orders, free user downloads, requests for samples or free trials, free pilot projects with customers, current active users, new sales leads per month, sales meetings per month, paid pilot projects with customers, paid customer sign-ups or paid downloads, and customer life-time value. This is coded as zero for closed firms.

- *Found out whether product or service can be covered by intellectual property protection:* a dummy variable that takes value one if the firm has found out whether their product or service can be covered by some form of intellectual property protection, and zero otherwise. This is coded as zero for closed firms.
- *Has at least one form of intellectual property protection or application pending:* A dummy variable that takes value one if the firm has, or has pending, a copyright, trademark, industrial design right, patent, or other form of IP protection, and zero otherwise. This is coded as zero for closed firms.

Investment Steps: this is an average of standardized z-scores of the following variables:

- *Has contacted an outside investor to see if they are interested in making an investment:* A dummy variable taking the value one if, in the last year, the firm has contacted an outside investor to see if they are interested in making an investment, and zero otherwise. Firms that say they are not interested in investment and that do not answer this question are assumed to have not contacted an investor. Coded as zero for closed firms.
- *Has made a pitch to outside investors outside of our program:* A dummy variable taking the value one if, in the past year, the firm made a pitch to outside investors at an event. Firms were explicitly asked to exclude pitches made during the semi-finals and finals of the Pioneers program. Firms that say they are not interested in outside investment are assumed not to have made a pitch. It is coded as zero otherwise, including if the firm is closed.
- *Have a mentor or external export supporting them to obtain external financing:* a dummy variable that takes the value one if the firm has a mentor or external expert helping them to raise funding, and is zero otherwise, including if the firm is closed.
- *Entered into negotiations with outside investor since August 2015:* a dummy variable which takes the value one if the firm has entered into negotiations with any outside investor since August 2015, and zero otherwise. It is coded as zero if the firm is closed. Firms which have been sold, or which have received outside equity investments, and which did not answer this question, are assumed to have entered into negotiations.

External investment: this is an average of standardized z-scores of the following variables[20]:

- *Taken on new debt since August 2015:* a dummy variable which takes value one if the firm has taken on new debt since August 2015, and zero otherwise. It is assumed to be zero for firms closed.
- *Have made a deal with an outside investor since August 2015:* a dummy variable which takes value one if the firm has made a deal with an outside investor (who is not family or friends) since August 2015, and zero otherwise. This takes value one if the firm has been sold, and zero if the firm has closed before being sold.
- *Received at least 25,000 euros in new outside investment since August 2015:* a dummy variable that takes value one if the firm has received at least 25,000 euros in outside investment since

[20] Our pre-analysis plan also originally added a fifth variable to this index: total amount of outside investment received. However, after our firms were very reluctant to specify the exact amount of funding received and this question was dropped from the second follow-up survey, and so is not included in the overall index.

August 2015, and zero otherwise. It is set at zero for firms that have closed and not been sold for more than 25,000 euros.

- *Received incubator/accelerator grant since August 2015:* a dummy variable that takes the value one if the firm has received a grant from an incubator or accelerator since August 2015, and zero otherwise.

Have made a deal with an outside investor since August 2015: a dummy variable which takes value one if the firm has made a deal with an outside investor (who is not family or friends) since August 2015, and zero otherwise. This takes value one if the firm has been sold, and zero if the firm has closed before being sold. Note that this is also considered as part of the external investment index, but given its role as a summary statistic of whether investment readiness leads to new investment, is also considered as an outcome by itself.

Appendix 4: Additional Details of the Treatment Program

Selection of Content

The treatment group intervention was designed to reflect best international standards for investment readiness programs and guarantee quality of training and mentoring. One of the main concerns for us was to find an implementer having the capacity to train more than one hundred firms across five countries in the Western Balkans in a limited amount of time. This required the availability of a considerable quantity of mentors, both local and international, willing to travel to the region and with a wide-ranging background of skills in business development. We also needed to find a partner with demonstrated capacity on organizing internationally renowned pitch events, where small and nascent enterprises have the opportunity to pitch in front of international investors and opportunity to network their product and ideas, witness successful stories from established young entrepreneurs and the investors' community.

The selection procedure consisted in three phases: a call for an Expression of Interest (EOI), followed by submissions of Technical Proposals (TP) and a final phase where we made a comprehensive assessment of the technical proposals and their compatibility with the Terms of Reference (TOR). The first phase saw eight companies submitting their EOI. We selected five out of the nine companies that expressed their interest for the second phase: all of them shared a few characteristics like an international focus, and a team with experiences in the region and familiarity with the SMEs and VC eco-systems of the Western Balkans.

The World Bank team reviewed these technical proposals, and also sought an outside evaluation from Professor Josh Lerner and his team at the Bella Research Group. They have worldwide experience in assessing venture capital eco-systems and business accelerator programs. In addition, we referred to the expert opinion of country officials in the Western Balkan region, experts in the local national innovation agencies, familiar with the regional eco-systems and hence able to detect incongruences of the technical proposals with local conditions. The final overall assessments merged the feedbacks of these three main sources: it listed the positives and negatives of each proposal and identified specific questions to be submitted to the applicants in case there were aspects to investigate further. The final ranking that emerged from the series of consultations and assessments identified the Austrian company Pioneers JFDI GmbH as the best suitable candidate for the planned intervention.

Pioneers JFDI GmbH was the best candidate because of the experience of their team in the region and in providing small businesses personalized training and advice, the competences and logistical as well as human capital capacity to deliver a widespread training program across five countries. Prior to 2011, the Pioneers team was involved with STARTeurope, which offered the Startup Live events, a series of training workshops and pitch events. Pioneers' mentors have deep experience as venture-funded startups entrepreneurs and represent the countries of interest in the Western Balkan region and in addition Austria, Germany, Greece, Israel, Lithuania, Poland, Slovakia, Turkey, United Kingdom and the United States. Many of their mentors come through the Pioneers JFDI GmbH program already, so they already know the curriculum and thus do not need to be trained.

Treatment website

The treatment was operated under a separate brand to ensure separation and clearly communicate the difference between the "Pioneers of the Balkans" competition and the investment readiness program for the treated group. The "Startup Live Mini-Accelerator" provided a dedicated website that also provides a central point of access to all of the treatment resources. It was password-protected to ensure that only invitees (i.e., Treatment Group participants, mentors, the program management team and World Bank Group team members) could access it.

At the beginning of the program each beneficiary of the treated group was provided with a starter kit including a detailed booklet with instructions and description of all the four parts of the investment readiness program: qualification phase, mentoring phase, masterclasses, and pitch training; and details of the Pioneers team and their contact details.

WhatAVenture

WhatAVenture asks a simple set of question about the business in order to i) match the entrepreneur with the appropriate mentor ii) understand the phase of development and the preparation of the entrepreneur in order to tailor to each firm the subsequent individual mentoring phase, iii) bring the treatment group firms to a similar level of qualification before proceeding with individual mentoring in the second stage of the training period.

The application WhatAVenture and the methodology therein was developed and tested in the context of post-graduate studies at the University of Economics and Business in Vienna, in close collaboration with leading academics and practitioners from the innovation and entrepreneurship field. It is an online interactive course for start-ups to put in words the details of their business idea, from the development of the business plan to marketing strategy and their financing needs.[21] The application is designed for self-paced progress along its steps. Once registered, startups assigned to the treatment group were

[21] Since the beginning of its external commercialization in 2014, the WhatAVenture has already been rolled out at several academic institutions as well as leading European corporates like Deutsche Telekom that use it for standardizing and professionalizing their intrapreneurship processes. Furthermore, several (corporate) accelerator programs like Bayer's Grants4Apps and two Austrian governmental equity financing and R& funding institutions (Austrian Federal Promotional Bank; Vienna Business Agency) have chosen the tool as their central application for tracking startups progress and coordinating mentoring sessions throughout their programs.

granted access to the tool until 31 December 2015 independent of their progress or advancement. After completing each step, they had the opportunity to discuss their progress, findings and potential questions or difficulties in short online mentoring sessions (typically 30-45 minutes). The main questions addressed with the WhatAVenture application are:

1. Customer Exploration: the first step requires the team to answer questions on the targeted customers, to identify the customer segment and to customer needs related to their product
2. Solution: develop a solution to the problem and match it to the customers' needs
3. Business model – frame a sound business model around the value proposition of the company
4. Competitor analysis – Elaborate on the competitive advantage of the firm, organize an idea of marketing, sizing and competitive positioning
5. Market size: define the target size of the customer segment
6. Financials: quantify the costs and revenue structures, expected profitability and financing needs until break-even

In the first meetings of the WhatAVenture the mentor takes some time to ask questions and understand in detail the product the company plans to market and the possible value generation. This is important for providing a better mentorship in the successive acceleration phase.

Assignment to Mentors

In the qualification phase each company was assigned a lead mentor from the beginning who takes the role of a direct contact person for getting started in the mentoring program. The lead mentors support their mentees not only as their personal sparring partner during the qualification phase but also as primary contact person and advisor during the acceleration and pitch preparation phases. Match-making is conducted based either on relevant professional experience (e.g., an entrepreneur in the dairy industry might be assigned a lead mentor with an academic background in dairy product management), personal interests (e.g., a participating business active in the area of design might be assigned a lead mentor with a passion for sailing), technical expertise (e.g., a team that lacks even a basic online presence might be assigned a web-/graphics designer as a lead mentor) or proximity.

In addition, a "Mentors Catalogue" was distributed to each firm. It contains relevant biographical and professional information of the 100+ mentors forming the pool of regional and international experts from where the participants can draw in addition to the assigned lead mentors. The catalogue was sent to the treated group beneficiaries in the welcoming package just before the beginning of the program and they were provided with an internet interface where they have access to the network of dedicated mentors, and where they have the possibility to screen the qualifications and the field of expertise of the mentors through a short CV and contact them directly to book a mentoring session.

In total the treatment group could benefit from 141 mentors, who came from 26 different countries. Most of them live in Austria (43.3%) followed by Serbia (10.6%) and Germany (9.2%). They can be divided in four main groups: standard teachers and mentors (i.e. business consultants, university and business school professors), successful entrepreneurs (i.e. CEOs of their companies), successful young enterprise investors (e.g. business angel investors, venture capitalists etc), leading public speakers and pitch trainers. All of them cover a wide range of expertise and have at least three years of mentoring

experience, while more about half of mentors have, individually, more than 10 years of experience in business mentoring. The majority having experience in business development and management in the IC&T industry; there are more technical mentors with a science background as software or hardware experts, payment systems and financial industry experts. Other industries were also covered, as for instance health care and pharmaceuticals, automotive and transportation, shipping and apparel sectors. All mentors have a good knowledge of business development, but a dedicated group of mentors was highly specialized in sales, marketing and e-commerce as well as intellectual property, competitive strategy and marketing. A smaller subset has experience in human resources, relationships and team building.

Acceleration phase

Upon successfully completing the qualification phase all beneficiaries are inducted into the acceleration phase. The individual mentoring sessions were scheduled on the online dedicated website to the program and were carried out either remotely via phone, video call[22] or on-site mentoring depending on the availability of mentors in the cities where the entrepreneur is located. It is important to note that among the pool of 100+ mentors many of them are internationals living and residing in the Western Balkan region, hence there was still the possibility to get international mentoring in English within the city of residence of the entrepreneurs. We ensured that every startup in the program gets some on-site mentoring exposure, partly also as an instrument to ensure their continued personal commitment to the program and to allow for the development of personal relationships beyond voice and video calls.

Average mentoring sessions typically lasted approximately 90 minutes and required additional work between sessions from the entrepreneur to improve the business proposal before the next session. In total we had more than 1800 hours of individual mentoring. Once a mentor submits his feedback to the central database, the information entered into the first part of the form is be forwarded via e-mail to the mentored entrepreneur, along with the request to likewise provide feedback to the mentor in question. This bidirectional feedback process not only serves the purpose of assessing mentees' satisfaction with the mentor and the benefit gained from a particular session, but also to validate the mentor's feedback and data entered by means of a counterparty review process.

Examples of the discussion in the acceleration phase were:

- Some companies were developing more products so needed advice on what would be best to focus on or whether to spin-off part of their business.
- Explore value proposition for different customer segments and how to structure it (i.e. B2B or B2C), how to implement it and what channels of communication to use. When necessary narrow down customer segment.
- Some firms needed a market validation - to take a prototype or mockup to target customers and test the outcomes.

[22] Remote session were arranged between both parties to take place either via Skype or, especially for remote group mentoring hosted on our software solutions to provide video calls (e.g. WebEx).

- Formulating and analyzing the competitor's matrix, set up a market research plan to investigate competition in target markets.
- Identifying local partners for collaboration and regional expansion.
- Mentors with software expertise helped digital platform businesses think about how to overcome "chicken-and-egg" problems in which customers do not want to use a platform if there are not enough providers, and providers do not want to use it if there are not enough customers.
- Offering advice on prototyping and pivoting to enable firms to start launching products sooner, and to avoid costly mistakes when manufacturing at scale by discovering technological issues earlier on.
- Defining a clear pricing strategy for different markets (e.g Western Balkans, Europe, U.S. etc)
- For companies in a more advanced stage discussions on possible financing options for current expansions plans, the amount to be asked and the form of partnership.
- Discuss legal ways to achieve monetization: early-stage selling, licensing to interested parties worldwide for franchising etc.
- Making sure the startup product abides to and will operate according to existing regulations and the differences in regulations between the EU and the Western Balkans for limited liability partnerships and equity financing.
- Practice to present the company in 5 minutes and in an elevator pitch of 90 seconds; preparation for the questions time to understand what investors want, and working on telling a clear story.

Masterclass weekends

Additional training during the acceleration phase is delivered in from of classes and lectures, these take place during 2.5 days "masterclass weekends" organized in the participating countries. At the masterclass weekends general business education is taught, courses such as marketing, finances, team building, sales, competition as well as rhetoric, body language and design.

A dedicated website for masterclasses and the material was set up, the portal also offers information about and access to a dedicated community communication channel "ChatGrape". This is an instant communication tool available as a browser-based application as well as native application for most mobile devices and allows for private as well as group communication in a structured way by allowing all users to set up and join subject-specific groups and to tag information and questions posted with key word expressions.

Masterclasses took place in the following four locations and dates:

- 9 to 11 October - Split, Croatia
- 16 to 18 October - Novi Sad, Serbia
- 23 to 25 October - Pristina, Kosovo
- 30 October to 1 November - Skopje, Macedonia

Each weekend had a main theme but were not exclusively dedicated to it with lectures, panels and presentations covering other topics as well. For example, the weekend in Split dealt with the business model, while the masterclass in Novi Sad with sales and marketing. The Pristina masterclass had the main lectures on team building and human resources while the Skopje weekend dealt with investment

and finance. The final program of each masterclass weekend was set up at the end of September and published on the information portal so that beneficiaries can gather information and decide which masterclass weekends they want to attend. Before each masterclass the mentors and the beneficiaries are provided with a guide that helps them to understand the organizational structure of the weekend and the benefits of participating in the weekend. Some examples of the content of the masterclasses are described below.

The lecture on “Research and networking” introduced the importance of research and networking for the best business model. It explained the difference between a business model and a business plan, how to prepare an action plan and structure a business model canvas step by step. It urged entrepreneurs to think about the weakest points of their plans and possible solutions. It then touched upon the importance of customers, competition, sales, marketing, traction, business development and finances.

The class “Rapid Prototyping” described how to move from an idea to a market validated product. It explained the concept of rapid prototyping, the importance and the methods of prototyping and using examples from the cinema, cars and smartphone applications sectors. It then covered the concept of minimum viable product (MVP) and the need to frame business hypotheses on the market reaction to their product, the customers and financial hypotheses too. All of them should be tested in the market to get feedback and fine tune product development.

The team building panel addressed questions on how to create a team and what are the most important features a new company must develop in order to have the investors’ attention. Two main things emerged: the first is that a successful enterprise has to form an eclectic and competent team encompassing all possible functions that a nascent company must have. The spectrum of functions proposed ranges from not only having a developer and an idea but also in having a good lawyer, a technician, a person familiar with the financing. But the most important of all seem to be having a very good member acting as a sales person. This figure should end up being most of the time the CTO of the company if not a co-founder because dedicated persons are really difficult to find, in those cases is the founder itself that must acquire sales skills and complement them with partners acting as supporters in this role. The importance of having a team with a wide-ranging expertise that complement each other turned out to be one of the best ways sending a positive message of confidence and investment readiness to the investors, a message saying that if you put the money in my company you are minimize the risk of wasting your money.

The traction presentation emphasized the importance of the three Ts: team, technology and traction. Traction because it is strictly linked with the term growth, with the importance of scaling up and having sustainable growth and having a “product-market fit” which is another way of saying that the product should be in line with the demand coming from the market. However it was stated that one size does not fit all and there are no general rules, what works for one company is not always good for others, as well as a channel to gain traction today is not guaranteed that will work for the same company some time down the road. The focus shifted then to the need to update the targets, reset the objectives forward every time a target is reached. The channels to increase traction were also covered, 19 of those

channels were mentioned and briefly explained (social and display ads, offline ads, email marketing, targeting blogs, direct sales, trade shows etc).

The presentation “The quantified startup” delved into trying to use data driven decision frameworks into strategic decision making of a startup. The presentation is directed mostly, but not exclusively, to web service providers, that is companies that can track their users online. What kind of metric are important to identify which stage your startup belongs at the moment, what metrics are important to scale up or increase traction? The presentation provided references of papers and books the presenter recommends to identify the metrics needed for every stage in the startup development. Measures such as churn, acceptance rate, viral coefficient, cost per user and similar were overviewed.

The presentation “How to sell to corporations” covered the topic of how to get access to established corporates for nascent startups. How to ally with them and exploit the market potential and value they have. One of the main point is that corporations, despite investing money in in-house accelerators and alliance partnership programs for startups, they do not really understand fully the value the startups that approach them have. So it is up to the startups to get ready for this kind of partnership, it is they that have to explain and convince the corporations of the value of their idea. The presenter described a process toward strategically thinking about approaching a corporation. How to convince corporations? Set the targets, find the best match, do your research, be well prepared, set our sales steps. An important aspect touched upon was that, once arranged a meeting you need to frame the meeting in order to get the idea convened, speak about concrete and clear things.

The lecture on B2B marketing saw a short introduction on the history of marketing. Some general information was given and the difference between the B2B and B2C marketing was explained. Introductions to new paradigms like the C2B and C2C was also described. The speaker explained processes of customer decision making and affiliation with a brand, with few examples from the most established companies and their marketing strategies. The importance of tradeshows for marketing was emphasized despite being an expensive option. But is one of the best way to get in touch with professional buyers informally.

The lecture on “EU funding” delved into the landscape of funding opportunities for startups and SMEs at the institutional EU level through EU structural funds for development. Information on different type of funding, the application process and the best way to approach these funding minimizing the load of work for the application. The need of a consultant for the application was also pushed forward as a good idea to develop these proposals and how much consultancy is needed.

The presentation “How to craft a pitch” as delivered in all four masterclasses and described how to structure the pitch and what to emphasize in it. The second part of the talk dealt with the 90 second elevator pitch. The emphasis for the 5 minute pitch was on seven main points to take into account: i) product/service what it is and explained it in detail to make the audience understand it, ii) market opportunity, what are the prospects, the vision and the demand for the product, iii) team, who are the main components of the team, what’s their expertise and role, iv) competition, v) finances and cost

structure, vi) development stage: where you are, at what stage, what you need, vii) future, where you will be, or expect to be, in 6 months to a year.

Pitch preparation

The mentoring program transitions into the Pitch Preparation Phase after the last masterclass weekend. This phase is intended to ensure that all beneficiaries focus their attention entirely on their pitch performance in the remaining two weeks before their appearance on stage in front of jury members in the semi-finals pitch event.

In the course of this phase, a standard pitch training approach was implemented, this was developed and tested in the context of the annual Pioneers Festivals and consists of the following steps:

1. The entrepreneurs were asked to upload the pitch decks (tailored to a 5-minute on-stage presentation followed by another 5 minutes of questions and answers with the jury). This pitch deck is then made available to the lead mentor for initial review.

2. The entrepreneurs schedule a video call with their lead mentor to begin practicing the pitch together.

3. During the sessions, the entrepreneur delivers his/her pitch and receive feedback on both the oral pitch performance as well as the pitch deck.

4. Lead mentor and entrepreneur may schedule additional sessions bilaterally to review progress as the entrepreneur implements recommendations.

5. In parallel, the program management team assigns each entrepreneur two additional mentors, one it has worked with already and one new mentor.

6. Also these mentors are asked to schedule pitch training sessions with the entrepreneur and request the latest version of the pitch deck.

7. The program management team collects and reviews feedback protocols to assess the entrepreneurs' preparedness for their Semi-finals appearance.

The entrepreneurs were encouraged to use the time between sessions to work on their pitch decks and practice their oral delivery of the pitch further. Additionally, to this standard pitch training cycle and the live "dress rehearsal" on the day prior to their pitch in the Semi-finals, entrepreneurs can request further support from specialists on rhetoric, body language or slide deck design by approaching relevant mentors from the mentors' catalogue if needed, or upon recommendation by one of their pitch preparation mentors.

Detailed cost breakdown

The cost of offering the program is provided in appendix Table 4.1

Appendix Table 4.1: Detailed Program Cost Breakdown

Investment readiness programs - Calculatory program cost

A. Individual mentoring	Unit	Quantity	Rate [USD]
1. Direct cost of individual mentoring	hours per beneficiary	30	1'917
2. Overhead cost per mentor	per beneficiary	1	326
3. Overhead cost of mentoring program	per beneficiary	1	492
4. Online mentoring tool	per beneficiary	1	338
Subtotal per beneficiary			***3'072***
B. Masterclasses			
1. Organization	per beneficiary	1	321
2. Venue & catering	per beneficiary	1	107
3. Lectures	per beneficiary	4	175
4. Travel and accomodation cost	per beneficiary	1	191
Subtotal per beneficiary			***793***
C. Pitch training			
1. Organization	per finalist	1	170
2. Venue & catering	per finalist	1	73
3. Pitch training	per finalist	1	279
4. Travel and accomodation cost	per finalist	1	168
Subtotal per finalist			***690***

Grand total per beneficiary			
A. Individual mentoring	per beneficiary	1	3'072
B. Masterclasses	per beneficiary	1	793
C. Pitch training	per beneficiary	0.33	230
			4'095

Grand total per investment readiness program			
A. Individual mentoring	Number of beneficiaries	150	460'865
B. Masterclasses	Number of masterclasses	4	118'932
C. Pitch training	Number of finalists	50	34'513
			614'310

Appendix 5: Additional Details of the Control Program

Selection of Content

We organized the control group intervention design around a few simple guidelines: i) an online course, ii) relatively cheap or free to use, iii) offering general knowledge of simple investment readiness concepts and iv) providing e-guidance toward a start-up pitching competition. The World Bank team conducted market research together with Innovative Ventures Incorporated, a specialized investment advisor to international financial institutions and governments in private equity and venture capital funds. After this initial screening of available alternatives the decision was made to use a paid online course since the alternatives without fee did not offer the necessary quality standards. For the paid alternatives we carefully evaluated the contents and undertook the full demo versions to understand the specific differences among the candidate courses.

The program chosen is an e-learning course developed and distributed by the Global Commercialization Group (GCG) of the IC^2 Institute at the University of Texas at Austin. The group is an internationally active facilitator for growth of innovative and technology based businesses and it offers a wider range of technology commercialization training programs for managers around the world. The Innovation Readiness Series™ was created to bring the work of the Global Commercialization Group to a global customer base at a cheaper price vis-à-vis delivering training and international business development programs in-country. Since its launch in 2011, the Innovation Readiness Series™ has trained more than two thousand entrepreneurs and students from 20 countries worldwide. The content can be offered in three different languages: English, Spanish or Russian. For the Pioneers of the Balkans cohort we opted for the English based course.

Course details and content

The program introduces students to common terminology used in the start-up eco-system, and the requirements to commercialize innovations, including protecting intellectual property, describing an innovation and the benefits it provides (vs. features), navigating development, understanding competition (substitutes and direct competitive products), market validation, creating a 'pitch' and presenting to investors, customers and others.

This content is delivered online through 10 modules of 45-60 minutes each. The modules have a set of slides that are read and explained via a recorded voice. Each module has detailed steps to work through for creating a business proposition and includes assignments in two formats: quizzes with multiple-choice answers beneficiaries can take to test their understanding of the material, and in the case of some of the ten modules (i.e. technology brief and description, benefits, competition and presentation skills) written exercises to be voluntarily handed in. Finally, in the last module there is the possibility to record and upload a video sample of the planned pitch. Nevertheless, for the Pioneers of the Balkans cohort the program was customized to allow feedback only after the multiple choice quizzes in form of number of correct answers. Written exercise and the video of the pitch were voluntarily uploaded on the platform but were not commented or discussed with the participant.

While this program is not a substitute to one-on-one mentoring, it gives a basic introduction to business planning and pitching, is well-structured and cheap alternative to a mentorship based investment readiness program, it is comprehensive and allows beneficiaries to create a sketch of business model

which can be presented to investors, customers and other interested parties. Moreover, it is a self-learning tool, beneficiaries can work at their own pace, the ten module series introduces the key concepts of innovation, and explores each of the primary issues that impact bringing a technology to the market allowing for a self-paced learning environment.

In terms of curricular incentives, at the completion of all the modules, beneficiaries who answer correctly at least 70% of quiz questions and take active part in all of them, receive a certification of Investment Readiness from IC2 Institute at the Texas University through the World Bank Group program "Pioneers of the Balkans".

The list of the ten modules and short description of the content is provided.

Module 1 – Introduction: the introduction module explains how the Innovation Readiness Series works, and the objectives for the course. It explains what commercialization is, and helps distinguish between innovation and invention.

Module 2 - Technical Description: the technology description module helps participants describe their innovation using technical jargon and key words.

Module 3 – Benefits: the benefits module teaches how to articulate the benefits of an innovation in a way that conveys value to customers and users.

Module 4 - Development Status: the development status module delivers an overview of the product development cycle with an eye to the market.

Module 5 - Intellectual Property, Part 1: explains what IP is, the different types of ownership, and what can be protected. It also explains Trademarks and Copyrights.

Module 6 - Intellectual Property, Part 2: the focus is on Patents and Trade Secrets, and provides a foundation to designing an individual IP strategy.

Module 7 – Competition: the competition module will help the participant discover and compare key benefits to those of the competition.

Module 8 - Market Validation: the market validation module explains the validation process and how to discover exactly what the market expects from an innovation.

Module 9 - Pitching Your Innovation: the planning and pitching module helps prepare a technology brief of the innovation and can be used in the next steps to commercialization.

Module 10 - Presentation Skills: the presentation module is taught by an internationally established and experienced public speaker, demonstrates how to deliver presentations in an effective and captivating way.

Depending on the previous experience of the participant and their commitment to hand in a written set of answers, a minimum of four weeks is recommended to deliver a basic course and the total envisioned time to complete the course lectures, answer the quizzes and compile the written exercises is 15-30 hours. However, recall that among the set of assignments only the quizzes after each session were graded and participants receive feedback on the number of correct answers. In case of written exercises and uploaded pitch video no feedback was offered so that the only incentive in that case was self-

motivation. Moreover only quizzes counted toward the receipt of the final completion certificate, given this incentive structure we expect a lower usage of the written exercises and video pitch uploads than multiple-choice quizzes.

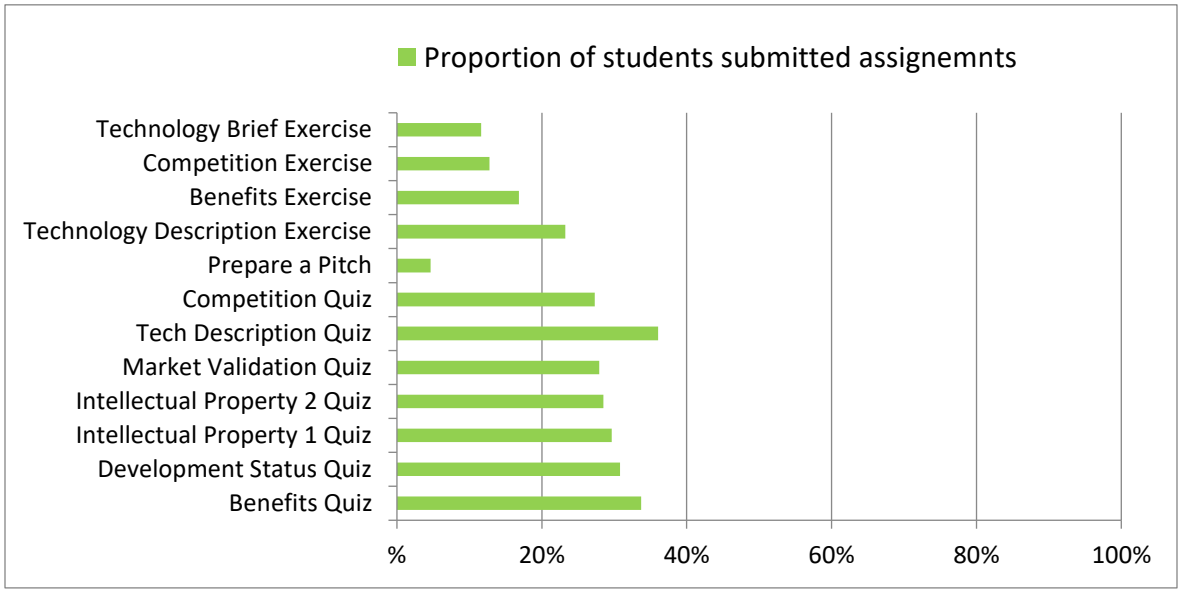
Communication and Reminders

During the deployment of the intervention our team sent weekly motivational announcements to the students on the platform and on their email address, the aim of the announcements was to promote learning and active participation. They were structured as progress reports where we showed the top ten performing firms in the last week in terms of correct answers in submitted quizzes, and explained the reasons why it is important to take part in the course. Firms were told that going through the modules would both help provide matching of their businesses with judges who had sectoral expertise in their business, and that going through the contents of the modules would likely increase their chances of getting a higher score in the semi-finals and getting selected for the finals.

Usage

Appendix Figure 5.1 summarizes the proportion of students that submitted assignments (either quizzes or written exercises), each bar corresponds to an assignment. Out of the 120 participants that connected at least once to the online platform, 63 (36.6% of the total) actively participated in one of the quizzes, with 45 of them completing the threshold of 70% correct answers. For the non-graded written exercises, the technology description was completed by 40 participants, the technology brief by 20, benefits exercise by 29 and the competition exercise by 22 participants. Lastly, only 8 students uploaded a video of their pitch.

Appendix Figure 5.1: Participation of the Control Group in Online Course Content



Satisfaction

A short survey was administered after the semi-finals to assess their satisfaction with different elements of the program. Respondents are therefore only the entrepreneurs that participated in the semi-finals.

The survey was answered by 102 treated group firms (92.7% of the treated semifinalists) and 87 control group (86.1% of control semifinalists)**.** Appendix Table 5.1 compares the overall satisfaction of the treated and control group semifinalists over few dimensions on a scale from 1 to 6. The treated group values more the communication, the structure and design and the training materials provided, the difference is statistically significant. However, the mean grade given by the control group to those dimension is well above 4. Recall that firms were blind to treatment assignment. Where there is no significant satisfaction difference between the treated and control group is in the feedback received from the jury at the semifinals and the organization of the semifinals. These features were common to both groups. As such, the satisfaction survey indicates the value added of the treatment also in the subjective assessment of the program by participants.

Appendix Table 5.1: Treated vs. Control Satisfaction survey – How satisfied are you with each of the following?

	Treatment			Control			
Dimension	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.	p-value
Communication overall	**102**	5.17	.95	**87**	4.55	1.44	0.014
Structure and Design of PotB	**101**	5.00	1.14	**86**	4.43	1.26	0.005
Training Resources	**102**	5.31	1.02	**84**	4.36	1.25	0.000
Jury Feedback	**101**	4.45	1.43	**86**	4.11	1.68	0.486
Semi-Finals (Belgrade Venture Forum)	**101**	4.45	1.42	**83**	4.34	1.36	0.861

Note: PotB denotes Pioneers of the Balkans program

Appendix 6: Additional Details on the Semi-Finals and Finals

Appendix Table 6.1 summarizes the characteristics of judges used for the scoring.

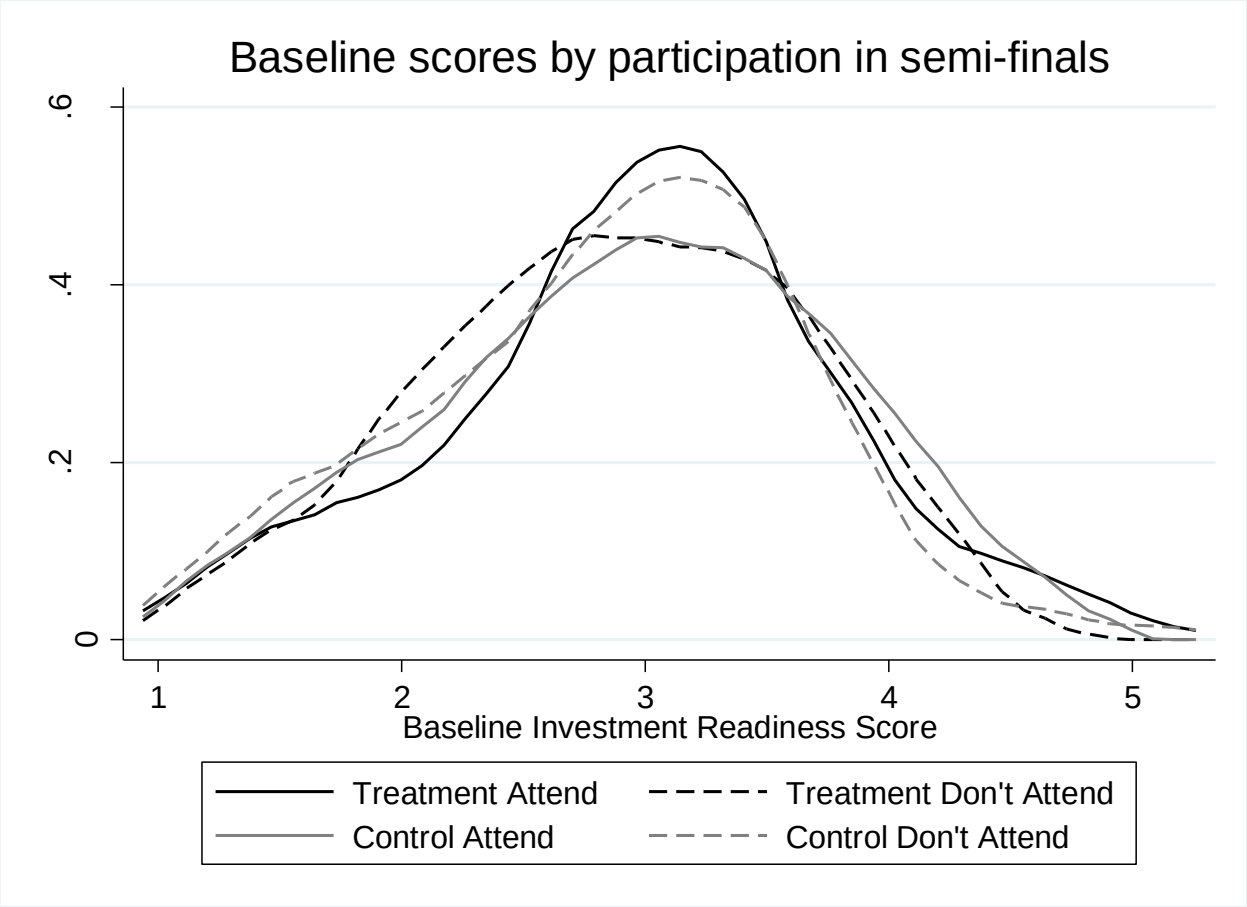
Appendix Table 6.1: Semi-Final Judge Characteristics

	Mean	**Std. Dev.**
Lives in the Western Balkans	0.37	0.49
Lives in European Union (except Croatia)	0.48	0.50
Male	0.88	0.33
Age	39.1	10.4
Has Founded a Company	0.75	0.43
Years of Experience in their industry	11.5	8.5
Company makes venture investments	0.64	0.48
Is an Angel Investor	0.37	0.49
Regularly Mentors Start-ups	0.80	0.40
Sample Size	**65**	

Note: data unavailable for one judge.

Appendix Figure 6.1 shows that the baseline distribution of investment readiness scores is similar for those that participated in the semi-finals (and therefore received judges' scores) and those that did not.

Appendix Figure 6.1: Baseline Investment Readiness Scores by Participation in the Semi-finals and Treatment Status



Robustness to Non-participation

Our pre-analysis plan specified two approaches to examining the robustness of our results to the attrition that results from not all participants attending the semi-finals, and therefore not having judges' scores for all firms.

The first approach is to impute investment scores for firms which did not participate in the finals. We pre-specified that we would do this by estimating the following equation on the control group sample who participated in the semi-finals:

$$OverallScore_i = a + bBaselineTeamScore_i + cBaselineMarketScore_i + dBaselineProductScore_i + eBaselineTractionScore_i + fCroatia_i + gSerbia_i + hBaselineOutsidePrivateInvestor_i + \varepsilon_i$$

This yields a prediction of the semi-finals investment readiness score as a function of the baseline scores on the different components, the country of operation, and whether or not they had an outside private investor at baseline. We replace missing scores for both treatment and control with these predicted values and re-estimate equation (1). The first column of Appendix Table 6.2 repeats our estimated impact on the overall score from Table 3, which assumes scores are missing-at-random. Column 2 then shows the impact on the score after imputing missing values. The impact is still positive and statistically significant, with an estimated effect of 0.19 points.

The second approach is to compare the participation rates of treatment and control and use Lee (2009) bounds to adjust for differential attrition. The participation rate in the semi-finals was 63.2 percent for the treatment group, and 58.7 percent for the control group. The difference of 4.5 percent is not statistically significant (p=0.39, or 0.37 after controlling for strata fixed effects). Nevertheless, we test sensitivity to this difference in attrition rates by dropping the top or bottom eight (4.5% of 174) scores from the treatment group. The next two columns of Appendix Table 6.2 then show the Lee upper and lower bounds respectively are 0.41 and 0.18. Since Table 1 and appendix Figure 1 shows that the differential attrition is not coming from the tails of the baseline investment readiness score distribution, we think it highly unlikely that it would be coming from either tail of the follow-up distribution either.

As a final robustness check, we show in the last two columns of Appendix Table 6.2 that our results are not sensitive to how we aggregate the different sub-scores. Column 5 aggregates the five sub-scores using equal weights instead of the different weights in our main specification, while Column 6 also includes the presentation score. We see the estimated effects of 0.277 and 0.293 are very similar in sign, significance, and magnitude to those using the unequal weights.

Taken together, these results show that the impact of treatment on the investment readiness score is unlikely to be driven by differential participation patterns in the semi-finals between the treatment and control groups, nor by the weighting, and so our finding that the investment readiness program has improved investment readiness is robust.

Appendix Table 6.2: Robustness of Impact on Investment Readiness to Attrition and to how scores are weighted

		Imputed	Lee	Lee	Equally weighted	
	Score	Score	Upper	Lower	5 components	6 components
Assigned to Treatment	0.284**	0.193***	0.408***	0.176	0.277**	0.293**
	(0.126)	(0.065)	(0.119)	(0.130)	(0.123)	(0.124)
Sample Size	211	343	203	203	211	211
Control Mean	2.908	2.865	2.908	2.908	2.950	2.966
Control Std. Dev	0.903	0.750	0.903	0.903	0.884	0.894

Notes:

Robust standard errors in parentheses. Regressions control for randomization strata.

*, **, *** indicate significance at the 10,5, and 1 percent levels respectively

Score is the investment readiness score in the semi-finals. Imputed score imputes missing scores based on regressing the score for the control group on baseline team, traction, market readiness, product technology, country, and having an outside investor and using predicted score for missing observations. Lee upper and Lee lower bounds trim the bottom 8 and top 8 scores respectively from the treatment group to adjust for higher attrition in the control group. Equally weighted scores weight the five (team, technology, traction, market and progress) or six (also presentation) sub-scores equally.

Procedure for selecting firms for the finals

There were two ways for firms to be selected for the finals. The main path was through an overall ranking based on the aggregate investment readiness score. Secondly, judges scored each firm after watching its pitch, and then at the end of the batch of six presentations, discussed the set of six. They then were asked to collectively rank the three best they had seen out of the six, and could choose to directly nominate the top-ranked firm to directly be sent to the finals. They were asked to use this direct nomination selectively, reserving it only for firms they believed should certainly be granted the opportunity to present in the finals. The idea behind direct nomination was to allow for the possibility that through collective discussion, the strength of a firm may be more apparent.

Sixteen firms were directly nominated to the finals, of which only four were not in the top-50 overall based on the individual ranks.[23] Then firms ranked in the top 46 based on the overall score were also chosen to give a total of 50 finalists. We then examined how sensitive these rankings were to allowing for differences in scoring amongst judges, and re-ranked firms on their residual scores after subtracting judge fixed effects. Four additional firms were chosen as finalists based on having judge-fixed-effect-adjusted scores in the top-50 even though their raw scores were not in the top 50. This gave a set of 54 firms that were invited to the finals.

Treatment Heterogeneity by Baseline Investment Readiness Score, and Quantile Treatment Effects

Appendix Tables 6.3 and 6.4 examine whether the treatment increased the signal contained in the pitches, thereby hurting those with initially low quality- described by Wagner (2017) as a *precision effect*. We find, if anything, those with lower initial quality benefited more (what Wagner (2017) refers to as an *improvement effect* more than offsets any precision effect), and that we cannot reject equality of impacts across quantiles.

Appendix Table 6.3: Heterogeneity of Impact on Investment Readiness Scores by Baseline Level

	Overall Readiness Score	Presentation Score	Std Dev of Judge Scores
Assigned to Treatment	0.203	0.249	0.020
	(0.178)	(0.230)	(0.062)
Assigned to Treatment*Baseline Readiness below Median	0.210	0.310	-0.019
	(0.254)	(0.335)	(0.105)
Sample Size	211	211	211
Control Mean	2.908	3.042	0.723
Control Std. Dev	0.903	1.145	0.317

Notes:

Regressions control for randomization strata and level effect of having a baseline investment readiness score below the median of 3.

Robust standard errors in parentheses, *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

[23] They ranked between 58 and 74.

Appendix Table 6.4: Quantile Treatment Effects on Investment Readiness Score

	10th	25th	50th	75th	90th
Assigned to Treatment	0.321	0.152	0.327**	0.467***	0.144
	(0.199)	(0.174)	(0.128)	(0.153)	(0.144)
Sample Size	211	211	211	211	211

Notes:
Quantile regressions also control for baseline investment readiness score country, and prior private investment. 10th, 25th, 50th, 75th and 90th indicate the quantiles at which treatment effects are estimated. Robust standard errors in parentheses, *, **, *** denote significance at the 10, 5, and 1 percent levels.
Test of equality of treatment effects across these quantiles has p-value: 0.243

Does Treatment Hasten the Failure of Low Quality Firms, or Make Them Less Likely to Get Funded?

Appendix Table 6.5 shows that it is not the case that the treatment speeds up the exit of lower quality firms, or makes them less likely to get funded. This is the case whether we measure quality using the baseline investment readiness score, or using the assessment made by judges using the pitch competition. The later is of course itself affected by treatment, so is intended as descriptive analysis, to show whether survival rates differ among treatment and control firms assessed by judges to be the same quality.

Appendix Table 6.5: Does Treatment Hurt Low Quality Firms and Help High Quality?

	Firm Survival				Made a deal	
	6 months	2 years	6 months	2 years	with an investor	
Baseline IR score	0.040	0.031			0.123***	
	(0.026)	(0.038)			(0.042)	
Baseline IR score*Assigned to Treatment	-0.038	-0.017			-0.047	
	(0.034)	(0.056)			(0.063)	
Assigned to Treatment	0.152	0.118	0.098	0.163	0.183	0.178
	(0.103)	(0.170)	(0.144)	(0.199)	(0.198)	(0.252)
Judge's IR score			0.020	0.059		0.167***
			(0.029)	(0.041)		(0.049)
Judge's IR score* Assigned to Treatment			-0.024	-0.038		-0.056
			(0.046)	(0.063)		(0.076)
Sample Size	319	340	198	208	330	206

Notes:
Marginal effects from probit estimation shown. Robust standard errors in parentheses.
*, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Performance in the Finals

The Finals event was held in cooperation with the Balkan Venture Forum on December 3 and 4, 2015 in Zagreb. This was the largest venture capital conference in the five target countries to date, with more than 400 attendees. The pitching slots were spread over two days and grouped into batches based on industry segments (business and productivity, lifestyle and entertainment, life science and energy, environment, and mobility and transportation). Jury members consisting of partners at venture capital

firms and managers of accelerators/incubators choose a category winner for each batch. Out of eight category winners, 6 came from the treatment group and 2 from the control. These category winners were publicly awarded with a large-format printed award and a bottle of sparkling wine. The three lead investors of the conference had each publicly committed to choose at least one firm each to give an "invitation to negotiate" for investment by the end of the conference. They extended these invitations to four finalists in total, of which 3 were from the treatment group and 1 from the control. The treatment group therefore did better, but because the absolute number of firms winning is so low, these impacts are still small in absolute magnitude (1 to 2 percentage points), and are not statistically significant (the smallest p-value is 0.157 for being a category winner).

Appendix 7: Benchmarking against other program participants

Although no general database of start-ups is available for the region, we can benchmark the participants in our program against the beneficiaries of the main start-up support program of the Serbian Innovation Fund. Their mini-grant program[24] offered grants up to 80,000 euros (average size 74,000 euros) in 2012-2014, and again in 2018. Firms had to be incorporated for three years or less, and based in Serbia. A total of 74 projects have been funded, and their agency provided summary statistics for the beneficiaries, which we compare to those in the Pioneers program in Appendix Table 7. We see the Pioneers program has considerable overlap in the types of firms, but also contains firms that are larger and more established than those that receive support from this other program. Our finding of larger impacts for smaller firms that are otherwise less likely to receive investor funding suggests that the program works best for precisely the types of firms the Serbian Innovation Fund is trying to support.

[24] http://www.innovationfund.rs/mini-grants-about-the-program/

Appendix Table 7: Comparison of Pioneers of the Balkans Firms to Other Beneficiaries

	Pioneers Firms	Serbian Innovation Fund Mini-Grant Beneficiaries
	% of firms	% of firms
Firm Characteristics		
Number of Employees		
1	15.6	29.6
2	15.3	18.3
3	16.8	21.1
4 to 6	31.8	26.8
7 to 10	9.9	2.8
11+	10.6	1.4
Age of Firm		
1 year or less	44.8	69.0
2 years	19.1	25.4
3 years	9.0	5.6
4 years	8.1	0
5 + years	19.0	0
At least one female founder	19.1	26.8
Main founder has post-graduate education	48.8	46.5
Made no revenue in previous year	47.4	52.1
Has received investor funding	9.3	2.8
Main Sectors		
Business and Productivity	43.4	
Lifestyle and Entertainment	20.5	
Materials and Manufacturing	11.9	
ICT		37.8
Software and application development		13.5
Machines and mechanical engineering		13.5
Energy and energy efficiency		9.5

Source: Summary statistics on mini-grant beneficiaries kindly supplied by Dane Atanaskovic of the Serbian Innovation Fund.

Appendix 8: Follow-up Survey Response Rates and balance on responders

Appendix Table 8.1 reports the completion rates by treatment status for three definitions of completion. Initially we began with a longer follow-up survey, which in addition to asking about our key outcomes, also asked a series of process questions about the Pioneers of the Balkans program and their reasons for participating or not participating. In order to encourage responses from more reluctant firms, we removed these questions to shorten the questionnaire for a second interviewing phase, with the short survey containing all the key outcomes in our pre-analysis plan. Finally, for firms that we could not interview after multiple attempts, we attempted to collect basic information in a few minutes from them, asking for their current operating status, their number of employees, whether they had entered

into negotiations with an outside investor to make an investment in their firm since August 2015, and how much new investment they had received since August 2015. In the second follow-up, this basic information was restricted to whether the firm was still operating, and whether it has received external financing, and also used web searches and secondary contacts.

We see that the treatment group was more likely to respond to the full survey than the control group in the first follow-up survey (p=0.066), but there is no significant difference in response rates for having at least the short survey, or at least basic information, and no significant treatment differences for the second follow-up.

Appendix Table 8.1: Follow-up Survey Completion Rates

	Overall	Treatment	Control	p-value
First Follow-up Survey				
Completed Full Survey	0.65	0.70	0.60	0.066
Completed at least Short Survey	0.79	0.80	0.78	0.781
At least basic information	0.92	0.93	0.91	0.520
Second Follow-up Survey				
Completed Full Survey	0.64	0.66	0.62	0.282
Completed at least Short Survey	0.85	0.86	0.84	0.504
At least basic information	0.95	0.95	0.94	0.873
Sample Size	346	174	172	

Note: p-value is for test of equality of treatment and control completion rates after controlling for randomization strata.
At least basic information denotes that information on whether the firm is operating and whether it has received external financing is available.

Appendix Table 8.2 compares baseline observables for the treatment and control groups, conditional on completing at least the short survey. We cannot reject that these observables are orthogonal to treatment status for either definition of survey completion. Given the lack of significant difference in response rates by treatment status, and that the sample responding to at least the short survey is balanced on observables, we treat attrition as missing at random in our analysis of the survey data.

Appendix 8.2: Balance Test on Sample Interviewed at Follow-up

	Answered First Follow-up			Answered Second Follow-up		
	Treatment	Control	P-value	Treatment	Control	P-value
Variables stratified on						
Incorporated/Registered in Croatia	0.230	0.237	0.869	0.27	0.24	0.623
Incorporated/Registered in Serbia	0.446	0.481	0.619	0.48	0.50	0.637
Baseline Readiness Score	2.997	2.899	0.183	2.93	2.94	0.163
Has an outside private investor	0.122	0.067	0.145	0.10	0.10	0.227
Other variables						
Market attractiveness score	3.112	3.062	0.885	3.06	3.09	0.657
Product technology score	2.485	2.419	0.649	2.44	2.48	0.872
Traction score	3.433	3.233	0.818	3.32	3.17	0.135
Team score	3.090	3.008	0.971	3.00	3.11	0.630
Sector is business and productivity	0.460	0.393	0.435	0.47	0.38	0.172
Sector is lifestyle and entertainment	0.187	0.230	0.516	0.19	0.23	0.428
Uses Cloud Technology	0.201	0.252	0.617	0.19	0.26	0.187
Uses Big Data	0.187	0.222	0.959	0.19	0.24	0.186
Place in value chain is developer	0.647	0.533	0.056	0.63	0.57	0.270
Place in value chain is service provider	0.568	0.533	0.479	0.59	0.56	0.482
Age of firm (years)	2.712	2.622	0.445	2.55	2.50	0.951
Early stage firm	0.331	0.304	0.475	0.32	0.37	0.464
Revenues in 2014	197649	157401	0.955	181796	127478	0.630
Number of employees	6.856	5.467	0.341	6.08	5.35	0.218
Age of main founder	38.216	36.563	0.222	38.02	37.19	0.433
Main founder has post-graduate education	0.525	0.496	0.934	0.50	0.50	0.770
At least one founder is female	0.137	0.222	0.066	0.15	0.22	0.063
Company has a global focus	0.583	0.578	0.850	0.59	0.60	0.815
Have accepted outside financing	0.374	0.348	0.559	0.35	0.39	0.614
Previously in mentoring/accelerator program	0.173	0.178	0.535	0.16	0.17	0.905
Sample Size	139	135		150	144	
Joint test of orthogonality of treatment p-value			0.417			0.167

Note: interviewed at follow-up denote that firm completed at least the short survey

Appendix 9: Treatment Effects on Individual Survey Outcomes

Appendix Tables 9.0, 9.1, 9.2, 9.3, 9.4 and 9.5 report the treatment impacts estimated on each of the individual outcomes that make up the aggregate indices presented in Table 3. Our main approach to multiple testing is to use the standardized indices of z-scores, which are contained in Table 3, and are presented again at the end of each table.

Appendix Table 9.0: Impacts on Components of Media Buzz Index

	Any media mention	Number of Media mentions	# Facebook likes	# Twitter Followers	Media Buzz Index
Panel A: Impact at Six Months					
Assigned to Treatment	0.047	0.786	-38.0	15.110	0.085
	(0.031)	(0.483)	(145)	(18.495)	(0.053)
Sample Size	346	346	346	346	346
Control Mean	0.099	0.663	1119	112.471	-0.060
stddev	0.299	3.410	2388	260.201	0.546
Panel B: Impact at Eighteen months					
Assigned to Treatment	0.039	0.736**	0.889	22.106	0.112**
	(0.030)	(0.291)	(218)	(18.974)	(0.047)
Sample Size	346	346	346	346	346
Control Mean	0.099	0.320	1430	106.866	-0.073
Control S.D.	0.299	1.566	3106	249.504	0.528

Notes: robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels. All regressions control for randomization strata fixed effects and for baseline values of outcome of interest.

Any media mention denotes firm was mentioned in news media in 6 month window, **number of media mentions** is the number of times the firm was mentioned, winsorized at the 99th percentile. **# Facebook likes** and **# Twitter Followers** are the number of Facebook likes for the firm's Facebook page, and number of Twitter followers for the firm, both winsorized at the 95th percentile. **Media Buzz Index** is an index of standardized z-scores of these first four columns.

Appendix Table 9.1: Treatment Impacts on Willingness and Interest in Taking on Equity Investment

	Interested in equity investment	Maximum equity share	Has specific deal terms	Would consider Royalties	Aggregate Index
Panel A: Impact at Six Months					
Assigned to Treatment	-0.019	3.920	0.001	0.025	0.051
	(0.066)	(3.169)	(0.061)	(0.065)	(0.094)
Sample Size	278	264	271	268	278
Control Mean	0.603	23.155	0.331	0.508	-0.015
Control S.D.	0.491	23.439	0.472	0.502	0.764
Panel B: Impact at Two Years					
Assigned to Treatment	-0.034	-2.175	0.050	0.105*	0.032
	(0.055)	(2.972)	(0.051)	(0.056)	(0.084)
Sample Size	309	285	309	303	309
Control Mean	0.575	25.066	0.242	0.487	-0.005
Control S.D.	0.496	26.591	0.430	0.501	0.783

Appendix Table 9.2: Impacts on General Investability

	Number Employees	Founder full-time	Positive Revenue	Revenue >10,000 euros	Positive Profit	Sales US/Europe	Aggregate Index
Panel A: Impact at Six Months							
Assigned to Treatment	1.100	0.061	0.008	0.035	-0.061	-0.019	0.026
	(1.215)	(0.052)	(0.061)	(0.068)	(0.059)	(0.060)	(0.085)
Sample Size	318	269	277	277	272	265	277
Control Mean	6.111	0.750	0.699	0.353	0.289	0.386	-0.039
Control S.D.	10.596	0.435	0.461	0.480	0.455	0.489	0.634
Panel B: Impact at Two Years							
Assigned to Treatment	4.554**	0.018	0.032	-0.017	0.085	0.051	0.089
	(1.814)	(0.061)	(0.071)	(0.068)	(0.061)	(0.055)	(0.082)
Sample Size	291	291	232	242	276	310	291
Control Mean	4.683	0.620	0.526	0.361	0.482	0.340	-0.058
Control S.D.	6.381	0.487	0.502	0.482	0.502	0.475	0.650

Appendix Table 9.3: Impacts on Meeting Specific Needs of Investors

	Separates Accounts	Has revenue projection	Knows customer acquisition cost	Number key metrics tracked	Found out if can protect IP	Has IP or pending	Aggregate Index
Panel A: Impact at Six Months							
Assigned to Treatment	0.060	0.066	0.009	-0.168	0.033	0.054	0.082
	(0.053)	(0.066)	(0.064)	(0.299)	(0.065)	(0.061)	(0.080)
Sample Size	268	268	268	268	269	269	269
Control Mean	0.742	0.561	0.409	2.106	0.439	0.364	-0.059
Control S.D.	0.439	0.498	0.494	2.598	0.498	0.483	0.682
Panel B: Impact at Two Years							
Assigned to Treatment	0.086	0.018	0.061	-0.092	0.059	0.049	0.084
	(0.060)	(0.061)	(0.059)	(0.361)	(0.063)	(0.057)	(0.079)
Sample Size	291	291	291	269	271	275	298
Control Mean	0.577	0.486	0.352	1.667	0.444	0.244	-0.059
Control S.D.	0.496	0.502	0.479	2.854	0.499	0.431	0.692

Appendix Table 9.4: Impacts on Steps Towards Investment

	Contacted outside investor	Made a pitch	Has mentor helping raise finance	Entered into negotiations	Aggregate Index
Panel A: Impact at Six Months					
Assigned to Treatment	-0.082	0.016	0.078	-0.008	-0.017
	(0.074)	(0.068)	(0.063)	(0.057)	(0.098)
Sample Size	239	240	232	279	240
Control Mean	0.509	0.549	0.236	0.323	0.008
Control S.D.	0.502	0.500	0.427	0.470	0.720
Panel B: Impact at Two Years					
Assigned to Treatment	-0.019	0.006	0.050	0.068	0.044
	(0.057)	(0.047)	(0.040)	(0.059)	(0.092)
Sample Size	282	282	279	279	282
Control Mean	0.324	0.184	0.097	0.328	-0.032
Control S.D.	0.470	0.389	0.297	0.471	0.760

Appendix Table 9.5: Impact on External Investment

	Taken on new debt	Made deal with investor	Received at least 25,000	Received incubator grant	Aggregate index
Panel A: Impact at Six Months					
Assigned to Treatment	-0.118**	-0.024	-0.032	-0.036	-0.152*
	(0.057)	(0.033)	(0.028)	(0.037)	(0.087)
Sample Size	276	279	277	269	279
Control Mean	0.419	0.083	0.068	0.090	0.084
Control S.D.	0.495	0.276	0.253	0.288	0.741
Panel B: Impact at Two Years					
Assigned to Treatment	-0.059	0.050	-0.024	-0.005	0.003
	(0.048)	(0.049)	(0.041)	(0.036)	(0.080)
Sample Size	278	330	317	268	330
Control Mean	0.182	0.244	0.168	0.076	0.018
Control S.D.	0.388	0.431	0.375	0.267	0.698

Note: n.m. denotes not measured in this survey round.

Appendix 10: Comparison of Firms with Low and High Likelihoods of Funding

Appendix Table 10 compares firms according to their Abadie et al. (2018) leave-one-out endogenous stratification classification of likelihood of receiving external investment if they are not in the treatment group.

Appendix Table 10: Comparison of Baseline Characteristics of Low and High Likelihood of Funding Firms

	Low Likelihood	High Likelihood	P-value
Variables stratified on			
Incorporated/Registered in Croatia	0.29	0.21	0.903
Incorporated/Registered in Serbia	0.39	0.55	0.874
Baseline Readiness Score	2.69	3.19	0.285
Has an outside private investor	0.02	0.17	0.353
Other variables			
Market attractiveness score	2.94	3.20	0.779
Product technology score	2.23	2.70	0.286
Traction score	3.17	3.37	0.041
Team score	2.74	3.39	0.122
Sector is business and productivity	0.39	0.48	0.024
Sector is lifestyle and entertainment	0.27	0.14	0.001
Uses Cloud Technology	0.22	0.24	0.222
Uses Big Data	0.20	0.20	0.219
Place in value chain is developer	0.56	0.61	0.505
Place in value chain is service provider	0.52	0.62	0.169
Age of firm (years)	3.09	2.03	0.002
Early stage firm	0.27	0.38	0.395
Revenues in 2014	192607	104538	0.393
Number of employees	4.63	7.24	0.134
Age of main founder	37.4	37.5	0.092
Main founder has post-graduate education	0.40	0.59	0.013
At least one founder is female	0.30	0.08	0.000
Company has a global focus	0.40	0.79	0.000
Have accepted outside financing	0.21	0.50	0.002
Previously in mentoring/accelerator program	0.04	0.28	0.000
Sample Size	169	169	