

Populated PowerUp Pre-analysis Plan

May 15, 2023

This document follows the guidance of Duflo et al. (2020), who recommend that the final research paper be written and judged as a distinct object from the "results of the PAP", with researchers then producing a short, publicly available report (the "populated PAP") that populates the pre-analysis plan (PAP) to the extent possible and briefly discusses any barriers to doing so.¹ We also indicate where each specified outcome appears in our research paper, or, in the small number of cases where an outcome is not included, the reasons for its exclusion. We use italics to denote what is new or different since the PAP was filed.

1 Background, Random Assignment, and Sample Characteristics

The PowerUp program is a capacity-building program for innovative small and medium enterprises in six countries in the Western Balkans: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. It has the main goal of helping firms to attract new customers, expand markets, adapt their business model, and bounce back from the COVID-19 pandemic by boosting demand for their products, thereby potentially making the firms more attractive to investors.

A public call for applications to the program was launched on September 2, 2020. The call was launched through Deloitte and the World Bank's social media channels, through Facebook and LinkedIn, local media, and through partnering organizations such as entrepreneurship hubs and Chambers of Commerce in each country. To be eligible for participation, firms had to be legally incorporated and registered in one of the six countries; operating for at least one year; have between 2 and 100 employees; be innovative and have a product or service that is already generating revenue in at least one market and be looking to boost sales; and not be conducting activities on a "negative list" such as arms, alcohol or tobacco. Firms had to apply online and fill out an application form. The program was offered free of charge, but companies had to sign a Memorandum of Understanding to commit their time to take part in the project.

A total of 412 firms applied for the program by the deadline of October 4, 2020, of which 250 firms were selected based on the eligibility criteria (the main reasons for rejection were being too small or not innovative enough). These firms were then asked to fill out a diagnostic questionnaire that would provide more details on their current traction and sales, their business practices, and their

¹Esther Duflo, Abhijit Banerjee, Amy Finkelstein, Lawrence F. Katz, Benjamin A. Olken, and Anja Sautmann (2020) "In Praise of Moderation: Suggestions for the Scope and Use of Pre-analysis Plans for RCTs in Economics", NBER Working paper no. 26993

investment readiness. The 225 firms that answered this diagnostic then provide the experimental sample used for this study. They were stratified based on country of operation (Serbia, Bosnia and Herzegovina, or other); whether or not they sold a digital product; and into three groups based on a diagnostic score assessed by Deloitte that measured their baseline levels of business practices and investment readiness. Half of the firms were then randomized to treatment and half to control within each stratum², resulting in 113 firms assigned to treatment and 112 firms assigned to control.

The selected firms are heterogeneous in sector. Just over one-third (36%) of firms are in the ICT sector, making customized software or providing information technology solutions for other businesses and consumers. Most of these firms are in software development. Examples include companies that develop mobile and web applications, e-commerce support, enterprise management software, cloud services, and other software consulting for other firms; companies providing digital marketing tools and support; supply-chain management; and helping firms to use new technologies such as virtual and augmented reality and 3D printing. The second most common industry is manufacturing (24%), which covers a wide range of activities including making specialized metal products, specialized clothing (e.g. safety gear for factories, medical uniforms, fashion items), food products (e.g. traditional food shipped online, organic processed food products) and wooden products (e.g. handmade window frames and shutters, boats). Professional services accounts for 14 percent of firms, and includes digital marketing firms, legal consulting, health services, and energy consulting. Four to five percent of firms are each in retail, tourism, and education.

Half (50.7%) of the firms rely on information technology for their core business model – as well as the ICT sector, this includes firms engaged in providing online learning, digital marketing services, financial payment technologies, remote sensing, and other digital services. 72 percent of firms are largely B2B firms, with firms in the ICT sector (94%) and professional services sector (90%) being particularly focused towards other businesses as customers, compared to firms in tourism (100%), education (100%), and retail (67%) being more focused on consumers as customers.

2 Treatment

The program content was implemented by Deloitte Consulting, led by its office in Bosnia and Herzegovina.

The treatment group is then offered a combination of virtual group-based training sessions by Zoom, as well as a series of one-on-one meetings with a Deloitte consultant. These training sessions took place between December 2020 and May 2021, with homework set after each one, and the one-on-one follow-up sessions interspersed. In total, they were offered just over 30 hours of group-training sessions, and 5 hours of one-on-one consulting. The group-based training sessions were as follows:

- Customer and Markets 1: COVID 19 Impact, Market growth, Competitive positioning, December 16, 2020
- Customers and Markets 2 –Customers and Digital Transformation - January 26, 27 2021

²The three categories provided (location, digital product, and diagnostic score group) formed 18 strata. There were 214 firms who had answered the diagnostic questionnaire by December 2, and they were randomly assigned within these strata. A further 11 firms that were late in responding were then separately randomized with equal probability to treatment and control within a 19th stratum consisting of 10 of these stragglers, and then the final firm was randomly assigned to treatment as a singleton.

- Financial Management and Profitability – February 23, 24, 2021
- Human Resource Management and Internal Organization- March 24, 25, 2021
- Customers and Markets and Market Expansion – April 28 or 29 (split by type of firm)
- Pitching – May 18, 19, 2021

The control group were offered 3 sessions of approximately 1 to 1.5 hours each, for a total of 4 hours of training. One session was on customers and markets, one on finance and internal performance, and one on pitching. At the conclusion of training, firms were provided with a pitch deck and traction sheet, which they were asked to submit to Deloitte by the end of May, 2021. These would be then scored by judges, and the top 25 proposals asked to submit video pitches, with the top 11 firms then selected to pitch live to investors at a finals event to be held at the end of June, 2021.

In practice, attendance data show that attendance was much higher for the customers and markets sessions than the other content, and examination of the training content slides and homework shows more of the tasks that firms were assigned to do were in this domain, especially in terms of using digital tools to reach new customers. Likewise, the one-on-one consulting sessions focused more on this topic. The paper provides attendance statistics.

3 Baseline Data Collection

Baseline data come from the application form and diagnostic questionnaire carried out in October and November 2020, and are in our possession at the time of writing this pre-analysis plan. No outcome data have currently been collected, and this short plan sets out our main plans for collecting outcome data and plans for analysis.

4 Follow-up Data Collection Planned

We currently plan on collecting follow-up data through:

- Submission of Pitch decks and Traction sheets (available June 2021)
- Judges scoring the pitch decks (June 2021)
- A follow-up survey of firms (planned tentatively for October-December 2021)

We also are investigating what sources of administrative data we may be able to link the firms to, and would like to conduct a longer-term follow-up survey in the second half of 2022 budget permitting.

In practice, pitch decks and traction sheets were submitted by May 31, 2021, and scored by judges in June. However, these were only submitted for 136 of the 225 firms (60.4%) and ended up being used to select which types of firms would best be ready to represent the region to investors seven months after the program started. A single follow-up survey of firms then took place between November 2021 and February 2022. The difficulty persuading firms to provide data meant that we were only able to collect a single follow-up round. The survey was answered by 180 firms (80%), and supplemented by data from the traction sheets to give some follow-up data on 194 firms (86%). However, some firms only supplied partial data, resulting in interim non-response on some measures.

We examined the possibility of linking firms to tax records and export sales. With six different countries with different tax regimes, and strong privacy restrictions on data access, we were not able to access tax data. We also were not able to link the firms to official tax records, and later realized that the prevalence of service-oriented firms meant that a large share of the firms would not show up in such data anyway.

The one set of non-self-reported data that we were able to obtain for all firms was to conduct a detailed scoring exercise on the digital presence of firms in December 2021. Improvement of digital presence to attract new customers was a key area emphasized by the program, and took on more importance during the COVID-19 pandemic as other opportunities to interact in-person with potential customers were limited. These data were collected by two independent consultants with linguistic knowledge of the prevalent languages in the region, who were blinded to treatment status.

5 Theory of Change

We have a simple three-step process in mind, which leads to examination of impacts at three levels. First, training should lead the firms to adopt new business practices and take specific actions recommended by the program. Second, these practices and the advice given may lead to the firm pivoting, innovating, and getting short-term traction with customers. Thirdly, these changes could lead to firms experiencing more demand for their products and achieving more customers, sales, and expansion into new markets.

Our research paper follows this theory of change. With the emphasis of the course on customers and markets and specific actions recommended in the digital space, this is where we expect to see the most change in step 1. There was less emphasis on pivoting and innovation, and more on reaching customers. Then, we focused our follow-up survey on trying to measure whether they had achieved more customers, sales, and export expansion.

5.1 Domain 1: Business Practices and Specific Actions

We discuss the different items that were specified, and then provide a table of results.

The traction sheet measures the following practices:

- Has surveyed customers to measure customer satisfaction
- Has calculated customer churn rate

These two practices are included as part of the overall "Business Practices" index in Table 2 in the paper, and in the sub-index of Customers and Markets reported in Table A6 in the paper.

These practices will be collected in the follow-up survey, and will be refined during the development and piloting of that survey, but we currently plan on measuring the following:

5.1.1 Area: Customers and Markets

- Does your firm use any form of customer loyalty program?
- Do you use the Google Analytics tool to track your website traffic?
- Do you track and analyze customer retention and churn?

- Does your firm use Search Engine Optimization (SEO)?
 - If so, have you revised this in the last 6 months to add new keywords or meta-data? Have you redesigned your website in the past 6 months to include:
 - * Faster loading of the website?
 - * Specific customer stories or recommendations?
 - * Blogs, videos or other story-telling content?
 - * Reworked how you describe your main product offerings?
 - * A clear call for action to the potential customer
 - * *We did not include these measures given that we looked directly at the digital presence of firms and were able to directly measure whether they had been done*
- Do you track the conversion rate on sales leads?
- Have you surveyed customers in the last 6 months to measure customer satisfaction?
- Did you take any specific action to improve customer satisfaction?
- Have you started using a new social media platform in the past 6 months?
- Have you introduced a change in sales protocols to make it easier or safer for customers to buy from you during the COVID-19 pandemic?
- Have you increased your use of stories, customer examples, and other content on LinkedIn?
- Have you used data to calculate your market share?
- Do you have a good set of customer personas developed, to understand ideal target customers?
- Do you use metrics or KPIs to regularly track marketing initiatives and sales growth?

All the practices above were collected in the follow-up survey and used in both the Customers and Markets sub-index in Table A6, and the overall Business Practices index in Table 2 in the paper, with the exception of measures of website quality - which were replaced by our exercise to independently measure digital presence in a more detailed way that would have no attrition. We additionally separately highlight the customers personas impact in Table 2 of the paper, given that developing these was one specific task given in the training.

5.1.2 Area: Digitalization

- Have you adopted a new digital technology in the last 6 months that allows improving the product or service the firm offers?
- What percentage of your goods or services do you sell online?

These two items are reported in the index adopted digital sub-index in Table A6 in the paper and are included as components of the overall Business Practices Index in Table 2 in the paper.

5.1.3 Area: Financial and Internal Performance

- Which of the following financial indicators have you calculated in the last 6 months?
 - Debt to equity ratio
 - Return on equity
 - Cash runway
 - Receivables turnover ratio
- Have you prepared a business forecast that covers the next year?
- Have you done a cash flow projection and compared actual cash flows to projections?

All six items were collected and are included as components in the Financial and Internal Performance sub-index in Table A6, and as part of the overall Business Practices Index in Table 2 in the paper.

5.1.4 Area: Networking

- How many other firms from the PowerUp program have you communicated directly with in the past 6 months?
- Which of the following have you done with another PowerUp participant:
 - Purchased a product or service from them
 - Made a sale of your product or service to them
 - Received information/leads on how to enter a new market
- Do you have any new business from a network connection provided by Deloitte that was not a PowerUp program company?

All these networking-related outcomes are included in the Networking sub-index in Table A6, and as components in the overall Business Practices index in Table 2.

5.1.5 Area: Market Expansion

Which of the following have you done in the past 6 months?

- Contacted a member of the diaspora to get advice/help entering a new market
- Identified a new potential partner in a foreign market?
- Hired a salesperson in another country?
- Benchmarked your product or service against that of your main competitors in the target market

All four outcomes are included as components of the Market Expansion sub-index in Table A6, and the overall Business Practices index in Table 2 of the paper. Note that these measures largely reflect offline activities, whereas because of the pandemic and nature of the firms, the course put more emphasis on expanding markets through digital tools.

5.1.6 Area: HR

- Have you done an employee satisfaction survey in the past 6 months?
- Have you made any changes in your employee compensation to more directly link employee compensation to new sales?
- Have you implemented any new training program or discussion with employees to better improve the way they interact with customers?
- Does your company have clearly set OKRs?
 - If so, were employees involved in developing these OKRs?
 - If so, how frequently do you track performance against these OKRs?
- Have you hired a new sales person in the past 6 months?

All of these HR-related outcomes are included in the Human Resources sub-index in Table A6, and are components in the overall Business Practices index in Table 2.

Table 1: Domain 1 Populated Results

Outcome	In Paper	Sample Size	Control Mean	Estimate	Standard Error
Customers and Markets Sub-index	Table A6	154	0.474	0.012	(0.035)
Market Expansion Sub-index	Table A6	154	0.500	-0.029	(0.051)
Adopted New Digital Technology	Table A6	154	0.405	-0.074	(0.081)
Percent of Sales Online	Table A6	151	0.465	-0.072	(0.075)
Human Resources Sub-index	Table A6	156	0.411	0.051	(0.049)
Financial and Internal Performance Sub-index	Table A6	153	0.609	-0.008	(0.058)
Networking Sub-index	Table A6	157	0.055	0.029	(0.024)
Use of Customer Personas	Table 2	153	0.541	0.165**	(0.077)
Overall Business Practices Index	Table 2	157	0.438	0.011	(0.026)
Google Score	Table 2	225	0.563	0.071**	(0.035)
Web Score	Table 2	225	0.531	-0.020	(0.023)
Facebook Score	Table 2	225	0.431	0.050**	(0.022)

Notes: Google Score, Web Score, and Facebook Score are the digital presence measures we were able to obtain through our independent web scoring measure, which reflects the specified idea to supplement survey measures with other sources of data.

5.2 Domain 2: Pivots, Innovations and Short-Term Traction

The traction sheet measures:

- New pivot: the firm has pivoted since December 1, 2020 to change the focus of their business to a different product, type of customer, or target market
- New innovation: the firm has started selling a new, upgraded, or improved version of a product or service

- Change in CSAT: change in customer satisfaction score between November/December 2020 and March/April 2021
- Change in Customer Churn rate: between November/December 2020 and March/April 2021
- Change in Website Visitors: between November 2020 and April 2021
- Change in Facebook likes: between November 2020 and April 2021
- Interested in outside financing
- Financial traction: number of months of operating expenses on hand

The most important measures here are the new pivot, new innovation, and then we will construct a standardized index of the other customer measures (CSAT, churn rate, website visitors, Facebook likes). We consider being interested in outside financing and financial traction as secondary outcomes.

More detailed questions on pivoting and innovation will be asked in the firm follow-up survey, and measures like website visitors and Facebook likes will be tracked over a longer time horizon with the survey.

Given that the program did not emphasize pivoting and innovation, and focused mostly on customers and markets, we only collected these in the traction sheet and did not ask more detailed questions on these measures in the firm follow-up survey. We use the new pivot measure defined as above, and report it in Table A8. We construct an innovation score based as the average of dummies for having developed a new product or service, and having upgraded a product or service. This is also reported in Table A8.

Only 53 firms reported CSAT scores, and they were on different scales (e.g. some in percentages, and some on 1 to 5 or other numeric scales). Given these data are available for only one-fifth of the sample, we do not use this outcome. Likewise only 45 firms report a customer churn rate, and again this is reported on different scales by different firms, and so we do not use this outcome.

Website visitors and Facebook likes were likewise sparsely reported and highly skewed, and we do not use in the paper, but report here for completeness, based on the traction sheet.

The outcome "interested in outside financing" was collected and is reported in Table A8 in the paper. The number of months of operating expenses on hand does not appear to have been well understood by some of the firms, and we are dubious about the data quality for this outcome for the firms that did self-report it. We show the estimated impact below, but do not include in the paper.

Table 2: Domain 2 Populated Results

Outcome	In Paper	Sample Size	Control Mean	Estimate	Standard Error
New pivot	Table A8	194	0.305	-0.037	(0.065)
Innovation	Table A8	194	0.563	0.016	(0.058)
Number of Website Visitors	Not included	101	8093	185	(4545)
Number of Facebook Likes	Not included	115	3509	2406	(1536)
Interested in Outside Financing	Table A8	147	0.743	-0.070	(0.072)
Months of Operating Expenses on Hand	Not included	146	4.597	0.552	(0.844)

5.3 Domain 3: Judges Scores

Firms will submit their traction sheets and pitch decks at the end of May/early June 2021. Each of these will be scored by three judges, who will be a mix of investors and experts in small and medium enterprise growth in the region. The judges will give firms a score out of 5 for each of the following seven categories, with pre-assigned weights then used to arrive at a total score. The total scores of each of the three judges will then be averaged to get a final score for each firm.

- Unique value proposition (20%) – this should aim to get at what the firm has to offer to customers, how it solves customer needs, and what distinguishes them from the competition. That is, does the firm have a “special sauce” and how good is it?
- Technology (10%) - does the firm have an innovative or new technology, where technology should be considered broadly to also include innovative processes as well as product innovation.
- Business model (10%) – is there a clear and compelling business model which explains how the firm will make revenue, grow and be able to return money to investors?
- Team (10%) – does the team have the relevant background and experience to make this happen?
- Traction (30%) – is there demonstrated growth in the business, that shows customer interest and growth, and rebound from the COVID-19 pandemic?
- Market expansion (10%) – has the firm expanded into new markets or new customer segments in the past year?
- Pitch deck effectiveness (10%) – is the overall pitch clear and compelling, and effective?
- Final score by Judges: the sum of the above seven scores, aggregated using the weights noted above.

We hypothesize that the treatment will be most likely to have an impact on traction, market expansion, and pitch deck effectiveness, but may also help the firms in better being able to explain their business and may have lead to changes in these other categories as well.

Note that these scores will only be available for firms that submit their traction sheets and pitch decks. Firms will be incentivized to do this by the chance of qualifying as one of the best projects to pitch to investors, being told they will get feedback on their pitch deck, and by this submission giving them automatic inclusion in a directory of participating firms that will be circulated to potential investors, as well as the chance for one on one meetings with investors and potential mentors. Nevertheless, we expect not all firms to submit these materials. We will check for whether attrition is balanced by treatment status and use inverse probability weighting as a robustness check if there is differential selection based on baseline observables.

Traction sheets and pitch decks were only submitted by 136 of the firms, and scored by judges. We realized that the timing of this right when firms were just finishing the program meant that it had not allowed much time for firms to grow their businesses from the program, and instead was largely a way of choosing firms to represent the region well in an event with investors. Table 2 of the paper shows the impact on judge scores.

Table 3: Domain 3 Populated Results

<i>Sub-component scores</i>						
Unique Value Proposition	not included	136	3.046	-0.063	(0.120)	
Technology	not included	136	2.928	-0.068	(0.135)	
Business Model	not included	136	2.990	-0.063	(0.116)	
Team	not included	136	3.000	0.077	(0.137)	
Traction	not included	136	2.836	0.043	(0.121)	
Market Expansion	not included	136	2.585	0.033	(0.142)	
Pitch Deck Effectiveness	not included	136	2.805	-0.055	(0.146)	
Overall Judges Score	Table 2	136	2.891	-0.007	(0.104)	

Notes: The paper shows the impact on the overall index, but not on the different sub-components of this index.

5.4 Domain 4: Firm Performance and Market Expansion

The traction sheet measures:

- Market expansion: Started selling products in a new city or country
- Employment growth: Change in full-time employees from December 1, 2020 to April 30, 2021
- Customer growth: Change in paying customers from September and December 2020 to April 2021
- Number of Countries Sales Made to in first four months of 2021
 - Number of Countries in the Western Balkans (out of 6)
 - Made a sale in the European Union
- Value of export sales
 - Has positive export sales
- Quarterly revenues of the company
- Profit/loss in Q1 of 2021 and April 2021
- Made a new deal with an investor since December 1, 2020

We will group these into two main subdomains: (a) Market expansion (measured by market expansion, number of countries sold to, making a sale in the EU, and having positive exports). We will construct a summary index measure also in this subdomain; and (b) firm growth and performance (measured by sales, profits, export values, and employment) and will construct an index in this domain. Since firm sales and profits are expected to be heterogenous and have long tails, we will use the inverse hyperbolic sine transformation for these outcomes.

The follow-up survey will measure these outcomes over a longer time horizon, and ask more detailed questions on market expansion to also try to capture whether firms are expanding by adding new types of customers in existing markets, as well as expanding to new markets.

Many of the firms were reluctant to share data on firm performance, and it takes time for impacts on firm performance to emerge. Profits were the hardest to collect, with firms not willing to declare them, and then a mix of negative and zero values along with positive values. One change that influenced our thinking since writing the PAP was the Chen and Roth (2023) paper on the drawbacks of the I.H.S. transformation when there is a mass of observations at zero - with the resulting estimates being sensitive to units of measurement, and a combination of extensive and intensive margin effects. This influences our focus on separating these margins for exports, which has many zeros. We focused our long-term follow-up survey on the measures the training emphasized and on our theory of change: achieving more customers, sales, and expansion into new markets. We separate our measures into extensive margin effects around expanding into new markets, and then firm growth and performance, which capture intensive margin effects of selling more in these markets. These main results are then reported in Table 4, and other extensive margin impacts in Table A7, and the less reliable profit results in Table A8. Employment growth and making a deal with a new investor were less the immediate focus of the program, and are also in Table A8.

Table 4: Domain 4 Populated Results

Outcome	In Paper	Sample Size	Control Mean	Estimate	Standard Error
<i>Extensive margin impacts</i>					
Started Selling in New City or Country	Table A7	194	0.463	0.076	(0.070)
Number of Western Balkan Countries with Sales	Table A7	167	1.802	0.067	(0.143)
Sells in the European Union	Table A7	168	0.580	-0.043	(0.067)
Exports at all (Export Extensive margin)	Table 4	139	0.676	0.049	(0.071)
Index of Extensive Margin Market Expansion	Table A7	139	-0.023	0.096	(0.120)
<i>Firm growth and performance</i>					
Number of Customers	Table 4	152	186	159**	(77)
I.H.S. of Total Revenue	Table 4	143	12.294	0.123	(0.379)
Total Exports (Unconditional)	Table 4	139	7.162	0.198	(0.643)
Log Exports (Conditional on Exporting)	Table 4	97	9.894	0.661**	(0.296)
I.H.S. of Profits in April 2021	Table A8	126	6.813	0.271	(1.182)
Winsorized April 2021 Profits	Table A8	126	15311	9780*	(5071)
Employment Growth	Table A8	143	0.005	0.102	(0.066)
Made a Deal with a New Investor	Table A8	154	0.155	0.020	(0.060)