

RANDOMISED CONTROLLED TRIALS AND OTHER EXPERIMENTAL APPROACHES IN THE AUSTRIAN RESEARCH PROMOTION AGENCY (FFG) – EXPERIENCE, LEARNINGS AND OUTLOOK

TESS LANDON AND HARALD HOCHREITER

DOI: 10.22163/fteval.2022.554

1 ABSTRACT

The objective of this paper/presentation is to highlight how experimental approaches, specifically Randomised Controlled Trials (RCTs), can be leveraged to evaluate and measure the impact of new programmes, support programme development and test new services in funding and innovation agencies. RCTs are seen in many facets of public policy, however RCTs as a method for innovation agencies to evaluate new initiatives is relatively new.

We present three RCTs implemented in the Austrian Research Promotion Agency (FFG) that have received funding from the European Union's Horizon 2020 research and innovation programme. The trials are implemented to evaluate the effectiveness of new measures intended to help strengthen R&I in start-ups and SMEs. Through these three examples, we aim to demonstrate the advantages in which RCTs can augment the evaluation of new services as well as challenges that come with implementing RCTs. For one RCT, we will present final results. Two RCTs are ongoing, and we will present the trial design. We also discuss the operational aspects of incorporating experimentation in an innovation agency.

2 INTRODUCTION

Policy experimentation can be a useful tool in guiding innovation policy making by supporting more informed decisions in a complex area of policy (Bravo-Biosca, 2016). Experimentation is not unidimensional in its application, namely the pursuit of growing scientific knowledge, but can be deployed in various contexts with various objectives (Bravo-Biosca, 2020). It can be leveraged for exploratory and discovery purposes, such as to test a causal mechanism or assumptions about a problem, as well as the feasibility and potential of a new intervention (Ludwig, Kling, & Mullainathan, 2011). It can also be used to directly evaluate or optimize policy interventions – whether for measuring the actual impact of an

intervention (e.g., impact assessment) or testing methods for policy intervention delivery or process improvement.

The objective of this paper is to highlight how Randomised Controlled Trials (RCTs) can be leveraged to supplement the evaluation of the impact of funding programmes and assist in the development of programme services and support measures in innovation agencies. In the next section, we present three Randomised Controlled Trials implemented in the Austrian Research Promotion Agency (FFG) used to evaluate the effectiveness of new measures intended to help strengthen R&I in start-ups and SMEs. Then, we discuss the learnings from these experiments as well as experimentation beyond an individual experiment. In the final section, we conclude.

3 RANDOMISED CONTROLLED TRIALS IN THE FFG

RCT is a specific form of research design that, in theory, goes beyond identifying correlation and instead provides more robust causal estimates. In principle, the fundamental design of an RCT is rather simple: participants in a sample (whether it be individuals or businesses) are randomly allocated to different groups, with each group receiving an intervention, and in the best case, one group receiving nothing (often called a control group). The impacts of the intervention(s) on specific outcomes are then compared across groups. The causal impact of the intervention can then be estimated while addressing potential selection bias, because the only difference between the groups, on average, is the randomisation. In practice, however, undertaking an RCT comes with some shortcomings; it is a rigid research design that requires a high degree of precision during the planning and implementation stages in order to acquire valid data and results (Deaton & Cartwright, 2018).

RCTs have been the standard in health policy (e.g. double-blind RCTs in clinical trials) for decades and are widely used in developmental policy, e.g. by the World Bank together with J-PAL, a research centre performing randomized impact evaluations of policy for poverty reduction. This research design has also been gaining traction in the field of innovation policy where it continues to show a lot of promise (Firpo & Phipps, 2019). One of the first trials where RCTs were applied in innovation policy was in the Netherlands in 2004 and 2005 to test the effectiveness of innovation vouchers (Cornet, Vroomen, & Van der Steeg, 2006). There is, however, still much to be learned about how and when to implement them for maximal benefit (Bravo-Biosca, 2020).

In a wider effort to move towards more informed decision-making, the FFG developed and implemented three RCTs investigating measures to foster innovation capacity of SMEs and start-ups with funding from the European Union's Horizon 2020 "Innovation in SMEs (INNOSUP)" programme.

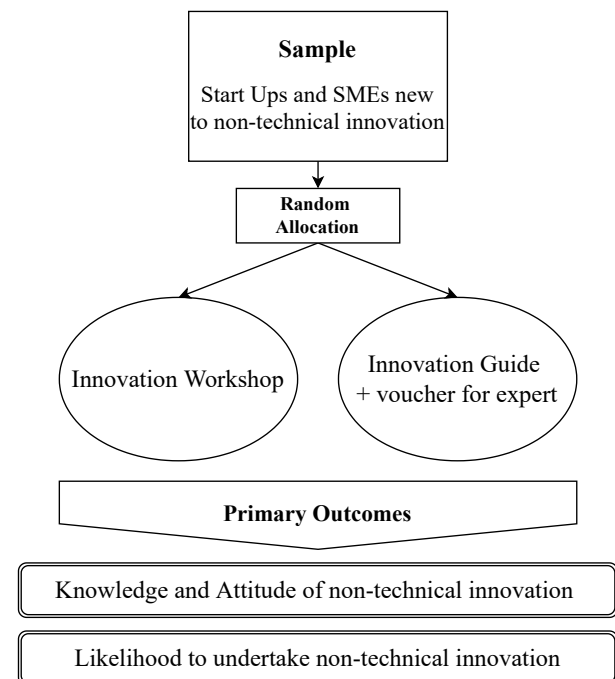
3.1 INNOVATION CAPACITY BUILDING IN SMES (INNOCAP, GRANT NR 824221)

Impact Innovation, a relatively new funding scheme in the General Programmes of the FFG (in German, "Basisprogramme"), was created with the purpose of providing a space for start-ups and SMEs to build know-how in non-technical innovation. Specifically, Impact Innovation funds early-stage, non-technical innovation projects with an emphasis on collaboration with users (or target group). Impact Innovation is designed to supplement traditional innovation policy measures, which primarily focus on advancing technical innovation and heavy investments in R&D, by bolstering the capacity of start-ups and SMEs to solve problems through "learning by doing", an approach that has been attributed with success in fostering innovation in European SMEs (Jensen et al., 2007; Parrilli et al., 2020).

An evaluation of Impact Innovation made evident that firms had shortcomings in planning and undertaking non-technical innovation projects. This was reflected in Impact Innovation proposals, where many applicants demonstrate a lack of understanding of iteration in project advancement, user involvement throughout the innovation process, and methods to manage and sustain innovation. Moreover, many firms who end up receiving funding in Impact Innovation still struggled with project implementation despite having a good project plan, citing a general lack of experience in innovation projects and associated methods. To address these shortcomings, two approaches to building knowledge on innovation processes were developed.

The RCT is therefore geared towards further developing Impact Innovation to better prepare innovation novices to undertake an innovation project. More specifically, we want to determine how best to improve firms' knowledge about and attitudes towards innovation processes thereby facilitating an improved implementation of innovation projects. To do this, the efficacy of two approaches on building fundamental knowledge of non-technical innovation process are tested.

Figure 1. InnoCAP Trial Diagram



SAMPLE

The target population are firms who are either considering starting innovation activities or already in the preparation phase of innovation projects. From the pilot RCT of InnoCAP, which tested measures to support innovation projects funded in Impact Innovation, we could infer that intervening after the project start (i.e., firms receiving funding) is too late for building up essential knowledge about innovation processes, as this knowledge could not be properly incorporated into the project plans. Thus, we targeted firms in earlier stages of their innovation projects.

We did not have direct contact with firms in the target population and thus had to recruit firms to the experiment. The recruitment process of our final sample consisted of two steps. First, firms were identified and contacted through two channels: Firms with an account on FFG's funding portal ("eCall") and firms in the FFG's multiplier network. The multiplier network consists of various innovation and entrepreneurial incubators, associations, and businesses that have a broad audience of start-ups and SMEs. Second, contacted firms were asked to fill in a survey, which measured baseline outcomes, relevant aspects for randomisation, and indicated actual interest in participating. The final sample comprised firms who completed the survey and is 61 firms.

A more detailed description of the recruitment process, including communication that was used, is available upon request. It will also be made publicly available with the final results.

INTERVENTIONS

Two interventions will be tested. The first intervention is an expert-led and peer-learning workshop in which experts from Impact Innovation provide input on essential aspects of the innovation process and experienced peers (previously funded Impact Innovation projects) share examples of how this might look in a project. In the workshop, firms will have the opportunity to discuss and work through their questions with both novice and experienced innovators in guided settings. The second intervention is a short guide highlighting important aspects of the innovation process and information on additional support resources, reflecting the content taught in the workshop. In addition, these firms will receive a voucher to an online expert platform, where they can link up with experts in a topic of their choice to assist them in development and implementation of a non-technical innovation project.

Due to the circumstances around firm recruitment to the RCT, it was not possible to include a control group in the experiment.

RANDOMISATION

The unit of randomisation was the firm, which were allocated evenly to one of two treatment arms. Randomisation was performed by researchers at the Vienna Center for Experimental Economics to minimize selection bias. Firms were block randomised on previous experience with Impact Innovation. In this context, previous experience with Impact Innovation is defined as having already received funding through Impact Innovation at least once. The rationale is that firms already funded by Impact Innovation have superior knowledge concerning innovation projects compared to firms with no prior experience with Impact Innovation. Eventually, 31 firms were allocated to the Innovation Guide and expert voucher arm (27 with no previous experience; 4 with previous experience) and 30 firms to the Innovation Workshop arm (26 with no previous experience; 4 with previous experience).

OUTCOMES

We are interested in three primary outcomes: *Knowledge of Innovation Process*, *Perceived Ability* and *Attitude towards Innovation*. *Knowledge of Innovation Process* assesses actual knowledge about the innovation process in Impact Innovation, specifically knowledge on problem-centered approach, iteration loops, innovation methods, and user involvement. *Perceived Ability* assesses an individual's perception of how well they can manage and implement the innovation process. *Attitude towards Innovation* assesses their perception of how advantageous they perceive non-technical innovation to be for firm development. All primary outcomes are measured with a pre- and post-intervention survey, measuring these indicators at baseline and shortly after the intervention period. We will be observing if there is improvement in actual knowledge, perceived ability, and attitude towards innovation projects.

As a secondary outcome, we are interested in *Innovation Activities*, specifically whether there has been an increase in innovation activities since the intervention. Six months after the intervention, participants receive another survey asking about the status of their innovation activities (e.g. applying for funding, working with experts, etc) since receiving the

intervention. Furthermore, qualitative methods in form of interviews will be used to learn more about mechanics of the interventions.

The survey measuring the primary outcomes is available upon request.

RESULTS

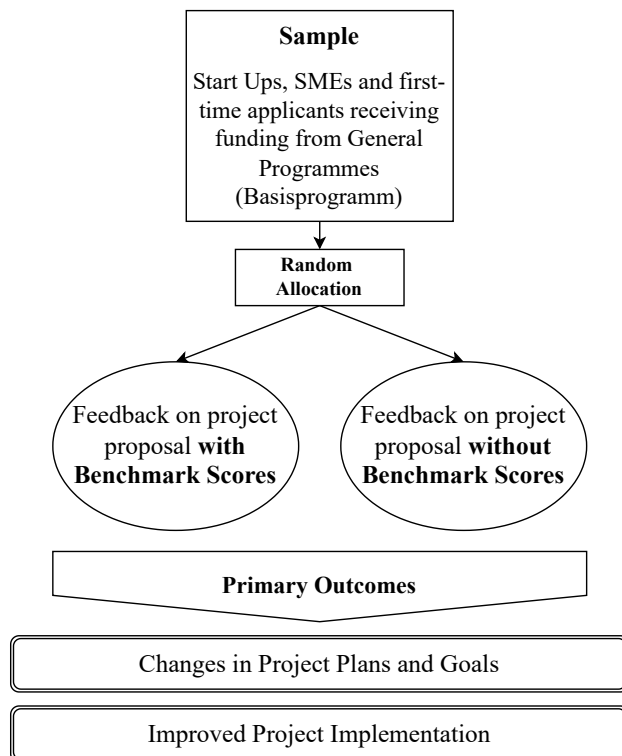
The trial was run in the first quarter of 2022. We are still in the data collection phase. Results are expected by end of 2022.

3.2 OPTIMIZING FEEDBACK FOR SMALL COMPANIES AND FIRST TIMERS (FEEDS FIRST, GRANT NR 824222)

The so-called "General Programme" is the largest and longest running innovation and research programme of FFG, open to all sizes of firms and types of research and innovation. An internal analysis of funding proposals in the "General Programme" found that the proposals of large enterprises who applied for the first time (subsequently referred to as "first time applicants"), SMEs and start-ups showed weaknesses in both the technical concept as well as the business plan. In order to provide additional support to SMEs, start-ups, and first time applicants funded in the "General Programme", we developed feedback on project proposals using data from the proposal evaluations outlining proposal-specific strengths and areas of improvement in four categories: Feasibility, Quality of the project, Utilization of project outcomes, and Sustainability.

Feedback given to SMEs and start-ups on business or innovation project proposals has generally been found to produce positive results (Wagner 2017). However, not all feedback is equivalent in evoking positive responses from those reading the feedback and initiating changes or improvements in business or innovation activities. While the information provided in the feedback is geared towards technical and business aspects of the project proposal at hand, people ultimately read, interpret, and integrate the feedback into the project. Thus, the presentation and type of information in the feedback as well as the person responsible for the project play an integral role in how and to what degree feedback is incorporated into the project (Mihm & Schlapp 2019; Yu, 2019; Liden & Mitchell, 1985).

In order to optimize the feedback on proposals funded by General Programmes, FFG and researchers at the University of Minnesota Carlson School of Management (UMN) developed an RCT to test the inclusion of relative ranking scores in feedback. The goal of the RCT is to understand if firms are more motivated to improve weak aspects of their projects when faced with their proposal's performance relative to their peers. Moreover, we will investigate the broader impact – negative or positive – of the intervention on the firm's likelihood to modify their project plan or project goals during implementation. We also hypothesize that outcomes may differ by size of organization (as categorized according to EU/FFG definition as either start-up, SME, or large enterprise).

Figure 2. FeedS First Trial Design

SAMPLE

The sample comprises 164 firms - 76 start-ups, 84 SMEs and 4 first time applicants – who received funding for innovation projects from the General Programmes in the period from November 2020 to December 2021. Our sampling procedure was a “trickle sample”, as firms joined the experiment on a semi-rolling basis. The General Programmes has a permanent open call for proposals and makes a decision on the submission seven times annually, thus firms were inducted into the experiment in nine batches in line with the funding decisions.

INTERVENTION

The intervention was a relative ranking score for each of the four categories in the feedback. The relative ranking scores reflect the respective firm’s performance in a specific category (e.g. feasibility) compared to all the firms in their batch (e.g. firm XY scored in the 60th - 80th percentile range in feasibility compared to other funded firms). The control group receives the same feedback sheet, only without the relative ranking scores.

RANDOMISATION

The unit of randomisation was the firm, which were allocated evenly to one of the two treatment arms. Randomisation was performed by research partners at the UMN in order to minimize bias. Firms were block randomized on firm size to ensure balance across both treatment arms. 84 firms were assigned to the control group comprising 39 start-ups, 42

SMEs, and 3 large organization. 80 firms were assigned to the treatment group comprising 37 start-ups, 42 SMEs, and one large organizations.

Due to the “trickle sample”, we did not know the final sample size nor the composition of the sample in terms of firm size prior to randomisation. To accommodate this and ensure that balance was achieved, our research partners at the UMN generated a dummy sample using projections based on historical funding data to determine the composition of start-ups, SMEs, and first-time applicants. They then block randomized the dummies according to firm size. After every funding decision, firms “replaced” the next dummy in the corresponding block in the order in which they submitted their proposal, thus assuming the dummies’ treatment arm assignment.

OUTCOMES

There are two primary outcomes of interest in this experiment, *Project Success* and *Project Changes*. *Project Success* is an ordinal variable assessing how well project implementation was executed. *Project Changes* is a binary variable measuring whether any deviations to the project plan (as set out in the proposal) occurred during implementation. Both outcomes are measured in a standardized procedure by the project evaluators at the end of the individual projects. Project evaluators were not aware of the treatment assignment of the firms whose projects they evaluated.

The secondary outcome of interest is *Perception of Feedback*, an ordinal variable where firms rate the utility of the feedback. We sent a survey asking the following question (translated from German to English) which was evaluated on a 4-point scale ranging from “Not at all helpful” to “Very helpful”:

- Perception of Feedback
How helpful did you find the Feedback?

Additional questions on specific aspects of the feedback (i.e. “What areas of feedback did you find most helpful?”) and open-ended questions on perceptions of feedback (i.e. “Please elaborate on how you incorporated the Feedback into the project.”) were also included in the survey to get qualitative insights for the feedback, overall. The survey is available upon request.

RESULTS

Randomisation and induction of the experiment ended in December of 2021. Results are expected by end of 2022.

3.3 SOCIAL INNOVATION MATCHED CROWDFUNDING (SIM CROWD), GRANT NUMBER 824220

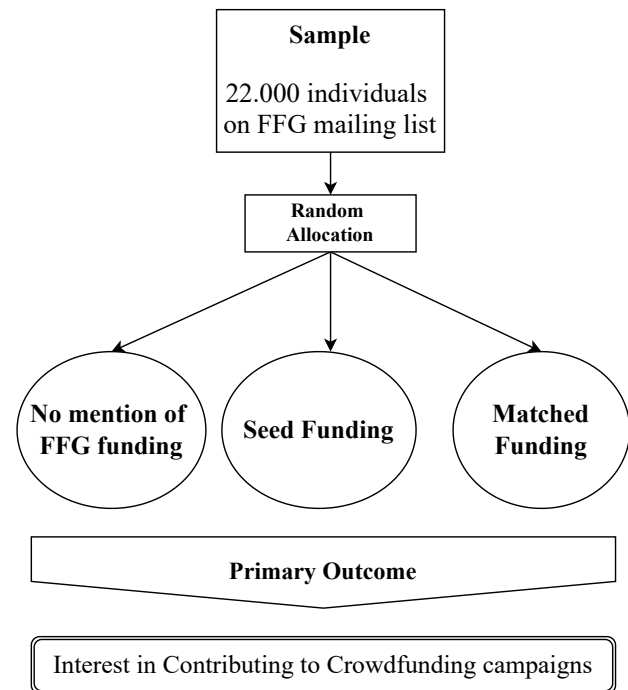
Social Crowdfunding, a new strand of the funding programme “Impact Innovation”, was developed to provide social innovators and entrepreneurs an opportunity to acquire additional funding through crowdfunding (CF), because social innovators often face difficulties to meet the self-financing requirement for “Impact Innovation” funding. Crowdfunding is a viable source of alternative financing for SMEs. European SMEs collectively raised an estimated 22.3 billion euros in 2020 through

crowdfunding¹. The premise of Social Crowdfunding is that social innovators receive support to develop and run an online, rewards-based CF campaign at the start of their innovation project, in addition to the funding received by “Impact Innovation”. However, influencing individuals to financially support the project presents a hurdle for CF campaigns.

Online CF campaigns face the issue of information asymmetry given the distance between potential supporter and the organization running the CF campaign (Agrawal, Catalini & Goldfarb, 2014). To overcome this, organisations must communicate their credibility, relevance, and ability to deliver on the CF campaign goal as well as project goal through other means (Ahlers et al., 2015; Moysidou, 2017). This can be done by including high quality media, e.g. short video about the project, and showing positive comments about the project from other small contributors on the campaign platform (Courtney, Dutta, & Li, 2016), as well as publicizing financial support from major contributors (Karlan and List, 2020; Vesterlund, 2003). The type of financial support from major contributors matters, however, as different forms of support rouse different motivations of individuals to give or not. For example, seed funding may signal the quality of the project (List and Lucking-Reiley, 2002) while matched funding may give the impression of a reduced cost of giving (Karlan and List, 2007; Lee et al., 2017). Moreover, motivations to financially contribute to social initiatives differ among genders, often leading to different contribution patterns among males and females (Mesch, Brown, Moore, & Hayat, 2011; Mohammadi and Shafi, 2018). In the specific context of public grants and social innovations in businesses, the most advantageous form of support is still unclear, and there is little evidence on its impact.

To understand more about the efficacy of pairing FFG grants with crowdfunding campaigns for social innovations, FFG and researchers at UMN developed an RCT to investigate the impact of various forms of FFG support on individuals’ likelihood to financially support a social CF campaign, specifically accounting for variations in gender (Bapna & Burtch, 2022). The final research design is a randomised, three-arm messaging trial testing whether the presence of public funding for a social innovation project has an effect on an individual’s likelihood to contribute to a crowdfunding campaign for that project. As an additional proxy for quality signalling of FFG financial contribution, we investigated individuals’ perceptions of the likelihood that the CF campaign and social innovation project will reach their goals. The differential impact of the treatments on all outcomes were also investigated with respect to gender.

Figure 3. Sim Crowd Trial Design



SAMPLE

Our final sample had 22,744 individuals. The sample comprises individuals in FFG’s Customer Relationship Management (CRM) database who are interested in receiving emails about calls to apply for funding, workshop information, field-related updates, among other things. In terms of the gender distribution, individuals who identify as male made up a considerable portion of the sample, around 68% in total, whereas females made up around 32%. Nearly half (49%) of the sample is affiliated with Higher Education or a Research Institute while another third (34%) of the sample is working in the private sector. The remaining sample participants (19%) were split among other organisations or did not specify their employer. Regarding previous contact with the FFG, half the sample (49%) has had previous documented interaction² with the FFG of which 10.7% took place in the 12 months prior to randomisation.

1 Retrieved from Statistica (2021) <https://www.statista.com/statistics/946659/global-crowdfunding-volume-worldwide-by-region/>

2 Documented contact refers to in-person meetings, phone calls, emails, letters, or faxes that was noted in the CRM database

INTERVENTIONS

The interventions were a small additional text in the email detailing the nature of the FFG funding for the social innovation project in addition to information about the crowdfunding campaigns. The control group received no information regarding FFG funding of the projects; one intervention group received a text describing FFG support as Seed Funding; the other intervention received a text describing FFG support as Matched Funding. Below are the English translations of the texts.

i) Control – No mention of FFG funding

“We would like to introduce you to two projects that address social challenges and are currently seeking funding through a crowdfunding campaign. If you would like these projects to be implemented, you have the opportunity to support them.”

ii) Seed Funding

Control Text +

„FFG has funded each project with the first 50% of the project costs, and the projects collect the remaining 50% through crowdfunding, among other means.“

iii) Matched Funding

Control Text +

„FFG funds each project with 50% of the remaining project costs if the project secures the first 50% of the project costs via crowdfunding, among other means.“

RANDOMISATION

The unit of randomisation was the individual, who were allocated evenly to one of the three treatment groups using a covariate constrained randomisation procedure. Covariate-constrained randomisation is a method used to ensure balance of baseline covariates among multiple treatment arms (Moulton 2004). Randomisation was performed by research partners at the UMN in order to minimize bias. As we hypothesized that outcomes would vary by gender, UMN block randomized on gender, while enforcing balance on additional available covariates such as affiliated organization and interaction with the FFG. Data on documented contact with the FFG, in particular, was included as a gauge for the likelihood that a recipient would even open the email. To see the output of randomisation and multinomial logit balance tests, refer to the publication of our research partners Bapna and Burtch (2021).

OUTCOMES

The primary outcome of interest was *Interest in Contributing*, a binary variable measured by whether an individual clicked on at least one link to visit the CF campaign webpage. The decision to click on the link and visit a CF campaign is an important precursor to actual funding (Bernstein et al. 2017, Bapna 2019, Bapna and Ganco 2021). Originally, we wanted to investigate the association between *Interest in Contributing* and actual contribution in this context, but it was not possible to measure the actual contribution of individuals directly, as there were many anonymous con-

tributors and other difficulties in matching FFG data with CF campaign data.

In addition to *Interest in Contributing*, we investigated *Perceptions of Funding Risk* and *Perceptions of Project Risk* associated with different types of FFG involvement in the social innovation projects. Funding Risk refers to the likelihood that the crowdfunding campaign would (not) succeed in reaching its funding goal and Project Risk refers to the likelihood that the project itself would (not) be realized. We chose these outcomes because they are indicators of quality signalling from FFG involvement which are not directly linked to financial contribution from an individual, thus complementing *Interest in Contributing*. These outcomes were measured through a survey asking, among other things, these two questions (translated from German to English) which were evaluated on a 5-point scale ranging from “to a great extent” to “not at all”:

- *Perceptions of Funding Risk*

To what extent do you agree with the following statement: “Due to the involvement of the FFG, I see a lower risk for the projects to achieve their funding goals.”

- *Perceptions of Project Risk*

Assuming that the projects were able to achieve their funding goals. To what extent do you agree with the following statement: “Due to the involvement of FFG, I see a lower risk for the projects to achieve their project goals.”

To ensure that respondents who answered these questions were aware of their respective treatment (i.e. those in the Control group were not aware of FFG Funding, and Seed and Match groups were aware of FFG funding), we asked a scanning question at the beginning of the survey:

“Were you aware that the FFG contributed financially to the projects [Wochenplan.digital](#) and [mitwirken.at](#) projects?”

To which respondents could answer Yes, No, or I do not know. Only responses to the survey where respondents in the Match and Seed condition responded ‘yes’ to the question, and respondents in the Control condition responded ‘no’ were included in the analysis.

RESULTS

A full analysis of the RCT was conducted by our research partners at the University of Minnesota and is available to read in Bapna and Burtch (2021). The results show that financial support from the FFG – in particular seed funding - signals quality of the social innovation projects and leads to a higher interest in contributing among females. When looking at the primary outcome - *Interest in Contributing* - females in Seed treatment arm demonstrated significantly more interest compared to females in the Control and Match treatment arms – 2.4 percentage points (50% relative increase) and 1.8 percentage points (35% relative increase), respectively. There was no statistically significant difference among men in different treatment groups, or in other words, men’s *Interest in Contributing* was not deterred by FFG financial support. Furthermore, there is evidence that indicating financial support from the FFG in the form of Seed funding positively affected females’ perception of campaign

success and project success, although these perceptions also varied by gender. When evaluating *Perceptions of Project Risk*, females in the Seed group perceived the social innovation projects to be significantly more likely to succeed in realizing their project goals compared to females in the other two treatment groups and males in the Seed group. There was no significant difference in *Perceptions of Funding Risk* among females in the three treatment arms.

4 LEARNINGS BEYOND INDIVIDUAL EXPERIMENTS

RCTs are not the only form of experiments that FFG conducts. Pilot actions³, shadow experiments⁴ or messaging trials (A/B tests) are examples of experiments that contain elements of RCTs, like randomisation or control groups, but are less strict in their design. What they all have in common is that they formulate ideas and hypotheses that are then tested or trialled in a structured and transparent way. They usually have a clear timeline, a concept how evidence will be collected and checkpoints at which results are assessed; and all this is designed *before* the experiment starts. An overview of such experimental approaches was published by Nesta (Hopkins, Breckon & Lawrence, 2020).

Getting to run a trial is often a process of constant negotiation and gentle nudges. A temptation might exist to jump head first into a large randomised controlled trial, however experimentation is not a cut-and-dry approach. Rather, running a trial is a process that may challenge the traditional ways of doing things and take an organisation into unknown territory. Designing experiments requires thinking “outside the box” of traditional processes and can have a positive impact on the discussion culture in innovation agencies. Starting small and bringing in external expertise also helped build up confidence, as trials do not always go according to plan. When they do not go according to plan and show unexpected results, they may trigger lively discussions, reflections, and a deeper understanding of underlying forces. This tends to open up “learning spaces” in which traditional standards and procedures can be discussed, and sometimes even modified, leading to more effective processes.

The development and implementation of experiments, in particular of RCTs, requires skills and an organizational culture not necessarily present in a public innovation agency. Engaging in experimentation therefore drives staff and skill development, however, it was also advantageous to collaborate with experts - FFG could tap into the valuable expertise provided by Innovation Growth Lab (IGL)⁵ by Nesta and their extensive network of research partners, which, amongst other benefits, led to a collaboration with the University of Minnesota for SIM Crowd and FeedS First. If and to what extent an organisation embraces experimentation also depends on the appetite for risk. Experiments can “fail” in the sense that they show results that go against ingrained beliefs or traditional

habits. To make the best out of such unexpected results, buy-in from senior management as well as an organisational culture that is prepared to accept and learn from such “failures” is very important. To this end, EU funding enabled us to pursue the RCTs described in this paper in a much more advanced form than would have been possible otherwise.

RCTs, in particular, are also a data heavy endeavour, which proved to be a double-edged sword. On the one hand, it gave us a structured way to exploit the mass amount of data already in the FFG, such as developing the feedback and benchmark scores in FeedS First, while at the same time innovating our data collection procedures by bringing new perspectives into the how, what, and when of data collection. On the other hand, (lack of) data was sometimes a limiting factor in being able to properly investigate a hypothesis. In certain cases, this was exacerbated by the EU GDPR regulations on data privacy, which made the process of data collection much more work intensive.

These positive effects come with a price. Experiments, especially full-fledged RCTs, are resource heavy, requiring both financial resources and time for a proper design, implementation and analysis. With the exception of messaging trials, they are better suited for bigger questions and where answers are not needed immediately.

5 CONCLUSION

RCTs and other forms of experimentation are an important tool in the set of methods used in evaluations as they open up new opportunities to test and evaluate the impact of programs and services. Evidence from SIM Crowd indicates that a seed funding commitment from FFG as a major donor can signal quality of social innovation projects. These results are informing future designs of the Social Crowdfunding program, particularly in how FFG grant should be communicated in CF Campaigns, but have also led to re-thinking future communications and the design of new funding measures beyond Social Crowdfunding. Although it is not yet possible to determine the impact on SME innovation capacity of the measures being tested in Inno CAP and FeedS First, carrying out the RCTs has already highlighted ways in which the FFG can improve data collection and external communication processes.

From an agency perspective, experiments create spaces for learning and change - elements necessary for a more modern innovation policy and agency. Experimentation moves the development of measures to capture and evaluate the impact of an intervention to the beginning of the experimentation process and strengthens the emphasis on developing clear impact pathways and indicators to measure success. At the same time, they also have a transformative effect on the culture as well as the way of working in an agency willing to engage in experimentation. However, experimentation can be resource intensive and demands specialized skill, thus it should be approached mindfully and is best done together with academics or other experts.

3 Pilot actions are used when the exact design of a new or changed programme or programme service is difficult to anticipate. Based on hypotheses and indicators defined at the beginning, the effect of the pilot action is measured and the design of the programme or service is adjusted accordingly.

4 Shadow experiments are typically data-driven experiments used to test variations e.g. in the way FFG reviews projects. These experiments are run parallel to the standard review process and do not influence its outcome but the results are used to optimize the standard processes. These experiments may or may not be randomised.

5 <https://www.innovationgrowthlab.org/>

6 REFERENCES

- Agrawal A, Catalini C, & Goldfarb A** (2014). Some simple economics of crowdfunding. *Innovation policy and the economy*, 14(1): 63-97. doi:10.1086/674021
- Ahlers G.K., Cumming D, Günther C, & Schweizer D** (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, 39(4): 955–980. doi:10.1111/etap.12157
- Bapna S** (2019). Complementarity of signals in early-stage equity investment decisions: Evidence from a randomized field experiment. *Management Science* 65(2):933-952.
- Bapna S & Ganco M** (2021). Gender gaps in equity crowdfunding: Evidence from a randomized field experiment. *Management Science* 67(5):2679-2710.
- Bapna S and Burtch G** (2021). An Experimental Evaluation of Major Donor Funding Schemes for Crowdfunded Social Ventures. Available at SSRN: <https://ssrn.com/abstract=3938577> or <http://dx.doi.org/10.2139/ssrn.3938577>
- Bernstein S, Korteweg A, & Laws K** (2017) Attracting early-stage investors: Evidence from a randomized field experiment. *The Journal of Finance* 72(2):509-538.
- Bravo-Biosca, A** (2016). Experimental innovation and growth policy: Why do we need it? *Innovation Growth Lab Policy Briefs*, 1. <https://innovationgrowthlab.org/policy-briefs>
- Bravo-Biosca, A** (2020). Experimental Innovation Policy. In J. Lerner and S. Stern (eds.), *Innovation Policy and the Economy*, 191-232. Doi:10.1086/705644
- Courtney C, Dutta S, & Li Y** (2016). Resolving Information Asymmetry: Signaling, Endorsement, and Crowdfunding Success. *Entrepreneurship Theory and Practice*, 41(2): 265–290. doi:10.1111/etap.12267
- Cornet M, Vroomen B, & Van der Steeg M** (2006). Do innovation vouchers help SMEs to cross the bridge towards science? (Vol. 58). CPB Netherlands Bureau for Economic Policy Analysis.
- Deaton A & Cartwright N** (2018). Understanding and misunderstanding randomized controlled trials. *Social Science and Medicine*, 210: 2-21. Doi: 10.1016/j.socscimed.2017.12.005
- Firpo T & Phipps J** (2019). New Running experiments in innovation and growth policy: What can we learn from recent experience? *FTEval Journal Research and Technology Policy Evaluation*, 47(1): 46 – 50. doi: 10.22163/fteval.2019.328
- Hopkins A, Breckon J & Lawrence J** (2020) *The Experimenter's Inventory: A catalogue of experiments for decision-makers and professionals*. Alliance for Useful Evidence, Nesta.
- Jensen M, Johnson B, Lorenz E, & Lundvall B.A.** (2007). Forms of knowledge and modes of innovation. *Research Policy*, 36(5): 680-693. doi:10.1016/j.respol.2007.01.006
- Karlan D. & List J.A.** (2007). Does price matter in charitable giving? Evidence from a large-scale natural field experiment. *American Economic Review* 97(5): 1774-1793. doi: 10.1257/aer.97.5.1774
- Karlan D. & List J.A.** (2020). How can Bill and Melinda Gates increase other people's donations to fund public goods? *Journal of Public Economics*, 191(401):104296. doi: 10.1016/j.jpubeco.2020.104296
- Lee D, Gopal A, & Lee D** (2017) Micro-giving: On the use of mobile devices and monetary subsidies in charitable giving. Available at SSRN: <https://ssrn.com/abstract=3280553> or <http://dx.doi.org/10.2139/ssrn.3280553>
- Liden R & Mitchell T** (1985). Reactions to Feedback: The Role of Attributions. *Academy of Management Journal*, 28(2):291 – 300. doi:10.5465/256202
- List J.A. & Lucking-Reiley D** (2002). The effects of seed money and refunds on charitable giving: Experimental evidence from a university capital campaign. *Journal of political Economy* 110(1):215-233. doi: 10.1086/324392
- Ludwig J, Kling J.R. & Mullainathan S** (2011). Mechanism Experiments and Policy Evaluations. *Journal of Economic Perspectives*, 25(3), 17-38. doi: 10.1257/jep.25.3.17
- Mesch, D., Brown, M., Moore, Z., & Hayat, A.** (2011). Gender differences in charitable giving. *International Journal of Nonprofit and Voluntary Sector Marketing*, 16(4), 342–355. 10.1002/nvsm.432
- Mihm J & Schlapp J** (2019). Sourcing Innovation: On Feedback in Contests. *Management Science*, 65(2):559-576. <https://doi.org/10.1287/mnsc.2017.2955>
- Mohammadi A & Shafi K** (2018). Gender differences in the contribution patterns of equity-crowdfunding investors. *Small Business Economics*, 50(2):275-287.
- Moysidou K** (2017). Motivations to Contribute Financially to Crowdfunding Projects. *Open Innovation: Unveiling the Power of the Human Element*, 283–318. doi:10.1142/9789813140851_0011
- Parrilli M.D., Balavac M, & Radicic D,** (2020). Business innovation modes and their impact on innovation outputs: regional variations and the nature of innovation across EU regions. *Research Policy* 49(8), 104047. doi.org/10.1016/j.respol.2020.104047
- Vesterlund L** (2003). The informational value of sequential fundraising. *Journal of Public Economics*, 87(3-4), 627-657. doi:10.1016/S0047-2727(01)00187-6

Wagner R.A. (2017). How Does Feedback Impact New Ventures? Fund-raising in a Randomized Field Experiment. Available at SSRN: <https://ssrn.com/abstract=2766566> or <http://dx.doi.org/10.2139/ssrn.2766566>

Yu S (2019). How does feedback Affect Entrepreneurial Performance? Available at SSRN: <https://ssrn.com/abstract=3272525>

AUTHORS

TESS LANDON

Austrian Research Promotion Agency (FFG)

Sensengasse 1, 1090 Vienna, Austria

E: Tess.landon@ffg.at

ORCID: 0000-0002-5491-994X

HARALD HOCHREITER

Austrian Research Promotion Agency (FFG)

Sensengasse 1, 1090 Vienna, Austria

E: Harald.hochreiter@ffg.at

ORCID: 0000-0003-1230-8486

KEYWORDS: Experimentation; RCT; SME support; innovation agency; innovation policy; public sector innovation