Evaluating innovation policy: how experimentation can help

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IGL

IGL is a global policy lab for more impactful entrepreneurship, innovation, and productivity policies

We help build more effective organisations, programmes and policies

Agile
Experimental
Data-driven
Evidence-based

IGL Government Members

Netherlands Enterprise Agency

Gobierno de España · Ministerio de Industria, Comercio y Turismo · enisa

CDTI Innovación

UKRI Innovate UK

Department for Business & Trade

FFG Promoting Innovation.

Department for Science, Innovation & Technology

Scottish Enterprise

EDA U.S. Economic Development Administration

IGL Research Network

Over 250 researchers from around the world working in the fields of innovation, entrepreneurship, productivity and growth, with a scientific committee including:

Nick Bloom Stanford Business School | **Dietmar Harhoff** Max Planck Institute for Innovation & Competition | **Karim Lakhani** Harvard Business School | **Josh Lerner** Harvard Business School | **Fiona Murray** MIT Sloan | **Mark Schankerman** LSE | **Scott Stern** MIT Sloan | **John Van Reenen** LSE | **Reinhilde Veugelers** KULeuven | **Heidi Williams** Dartmouth

www.InnovationGrowthLab.org

Evaluations are frequent, but not very robust

All support schemes

Credible (2.4%)

+ Impact (0.6%)

Innovation schemes

Credible (3.7%)

+ Impact (0.4%)

Source: Charts based on the systematic reviews conducted by the LSE-based What Works Centre for Local Economic Growth (Credible: Level 3 Maryland Scale – Positive impact on employment)

Innovation policy and impact evaluation

Internal validity in causal outcomes estimation
(feasible, credible and measurable counterfactual)

Level	Impact evaluation approach	Some underutilised tools & opportunities
Framework conditions (e.g., tax, regulation)	Qualitative analysis/case studies with some supporting data (unless setting allows natural experiment/IV estimation)	Data science
Ecosystem (e.g., clusters, infrastructure)	Combination of qualitative (for ecosystem and instrument interactions) with counterfactual methods for underlying activities	
Targeted programmes (e.g., grants, advice)	Quasi-experimental and experimental methods (e.g., RCTs) with supporting qualitative research (e.g.,mixed methods).	More admin data use with quasi-experimental methods RCTs

Challenges of evaluating innovation policies

1. **Difficulty establishing causality:** Most evaluations provide suggestive correlations without a credible counterfactual - Difficult to separate the effect of the policy from unobserved characteristics or selection

2. **Outcomes hard to measure:** Innovation is a fuzzy concept and most available indicators (patents, startups, collaborations) are incomplete proxies

3. **Long time horizons:** Innovation outcomes often take years to materialise. Using intermediate outcomes can help provide earlier insights

4. **Policy mix and interactions:** Policies typically combine a mix of different instruments. Often difficult to consider interactions with other instriuments in individual instrument evaluations.

5. **Skewed distribution of results:** Most projects fail while a few drive extreme success. Measuring average effects can be misleading and detecting tail outcomes requires very large samples

6. **Survey response rates:** When relying on surveys it can be hard to get businesses to provide accurate and comparable responses

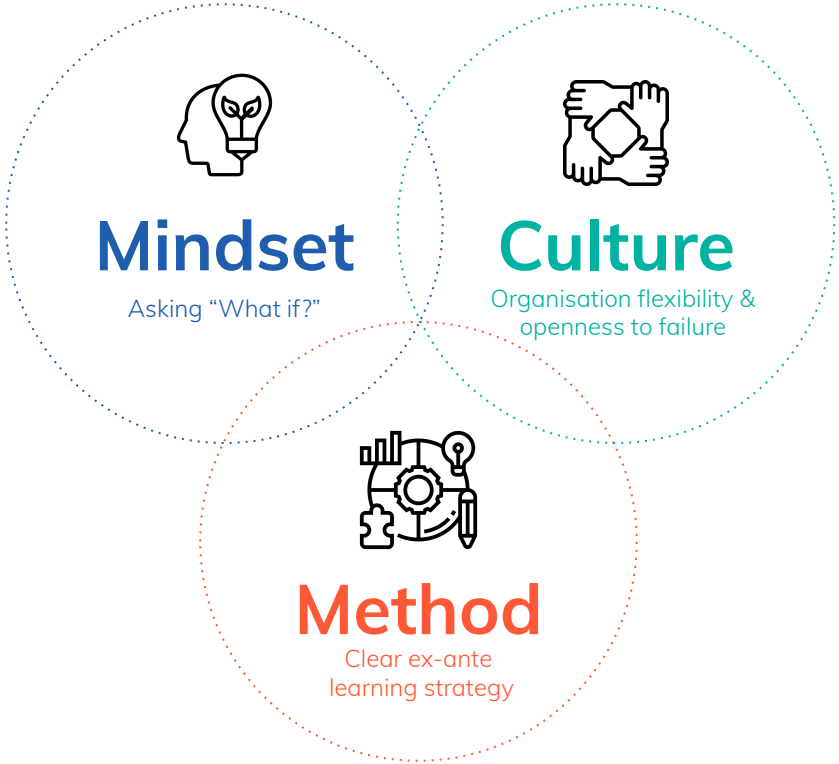
Policy experimentation has been underutilised in innovation policy

The dual benefit of policy experimentation

Policy innovation

Evidence generation

What's required to be experimental



What is an experiment?

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~~**Trying something new**~~

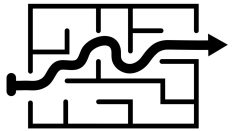
Common use

"a **test done in order to learn** something or to discover if something works or is true"

Cambridge English Dictionary

→ **Learning** is the priority; **intentionally** test hypotheses in a **structured** way, and within set **timeframes**

Answering different questions: An experimental approach to policy



→ Is applying different forms of experiments to navigate from uncertainty of the need for intervention through to evaluating final impacts

TO START

Establish the rationale

Experimentation can help to test underlying drivers to de-risk uncertainty about what activities might help achieve the target.

PROGRESS OR PIVOT

Inform design

Experimentation can explore various mechanisms and test assumptions through small-scale pilots before large investments are rolled out.

Optimise delivery

Experimentation can test different versions of a delivery approach or allow for comparison of implementation modes

TARGET HIT

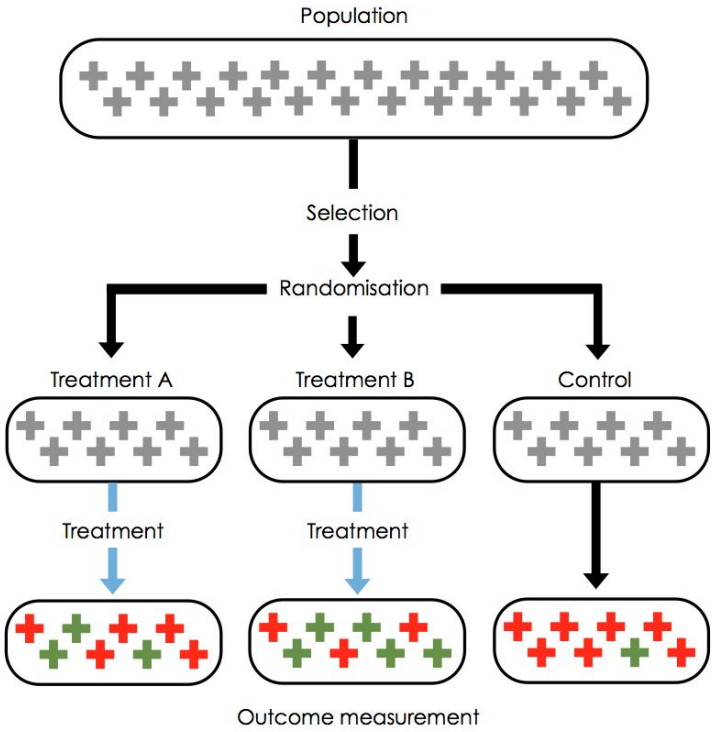
Evaluate impact

Experimentation can measure the effect of a specific intervention, so that we know that our project is having the desired impact.

Solutions are unknown

Solutions are known

We can use randomised experiments (RCTs) for...



- **Evaluation:** Impact evaluation of new programme or changes in the design of an existing one
- **Optimisation:** Testing small tweaks in implementation process (rapid fire A/B testing)
- **Diagnosis:** to identify the underlying causes and mechanisms that justify and inform policy interventions

Potential uses of RCTs in innovation & growth policy

- Compatible with different policy rationales (Market failure, system failure, mission driven) The actual instrument is what matters
- Do not answer large-scale prioritisation exercises (picking missions, research fields, themes, regions, etc.)
- Can be used alongside other methods as part a wider evaluation strategy mixed methods is best

	Mechanism experiments	**Optimisation experiments**	**Evaluation experiments**
Framework conditions (e.g., tax, regulation)	Medium	Medium	Low
Ecosystem (e.g., clusters, infrastructure)	Medium	Medium	Low (overall)/ Medium (toolkit)
Targeted programmes (e.g., grants, advice)	High	High	High

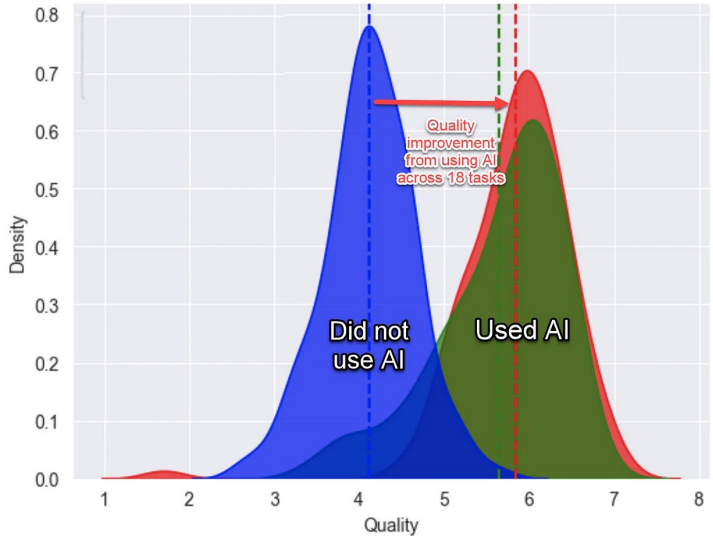
Example - Diagnostic

Research collaborations: Do "search costs" limit collaborations? An experiment showed how facilitating face-to-face interactions amongst researchers in the same research department would increase collaborations.

→ Researchers were 75% more likely to collaborate

How will AI affect productivity: To help understand the likely impacts of AI experiments are investigating how AI usage can affect outcomes in a range of contexts such as how consultants handle knowledge-intensive tasks.

→ AI improves quality of task completions



Source: Dell'Acqua et al (2023) "Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality"

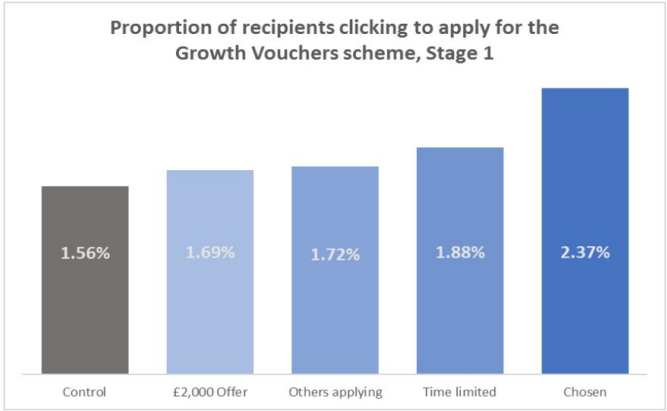
Example - Optimisation

Better Questions: An experiment showed how changing investment organisation's practices for evaluating proposals could support investment into women-led startups - changing the system not the seeker.

→ Reduced gender disparities in how proposals were evaluated and scored

More effective messages: the UK Business Ministry has run a range of 'nudging' trials, for example experimenting with the wording of emails encouraging people to apply for business programmes.

→ Additional 9000 applicants from one messaging trial



Source: BIT "You have been selected": Driving uptake of Government schemes"

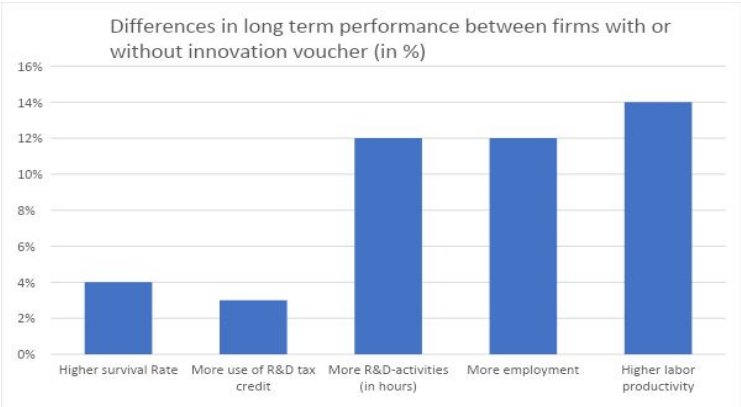
Example - Impact Evaluation

Innovation vouchers: UK and Dutch trials enabled by use of lotteries to allocate oversubscribed vouchers. Both experiments show vouchers supported innovation, with the Netherlands trial also showing long term performance benefits.

→ 25% more innovation collaborations in first year (UK)

Scientific Entrepreneurship: A series of four trials have revealed the benefits of teaching entrepreneurs a 'scientific' approach to decision-making as part of a training programme delivered to all participants.

→ More decisive decisions and improved business performance



Source: Roelandt and Wiel

Science and innovation funding

Improving how science and innovation funding mechanisms are designed and managed

The experimental research funder's handbook

We worked with the Research on Research Institute (RoRI) and its global consortium of science funders to develop a handbook showcasing experimental opportunities to improve science funding processes.

UK Metascience Unit Experimentation

We've supported the UK's government newly created Metascience Unit to scope and design the first batch of experimental projects to improve science and innovation funding.

Accelerator For Innovation & Research Funding Experimentation (AFIRE)

A broad platform to support the design, implementation and synthesis of experiments with research and innovation funding. First sprint on AI in review processes.

NASA SBIR

IGL helped the NASA SBIR team to build a more experimental culture and identify experimental opportunities to improve the execution of the programme.

University-industry collaboration

Bridging the gap between university and industry to accelerate science commercialisation and drive societal impact

Experimenting in University-Industry Collaboration

[An Innovation Growth Lab Ideas Handbook]

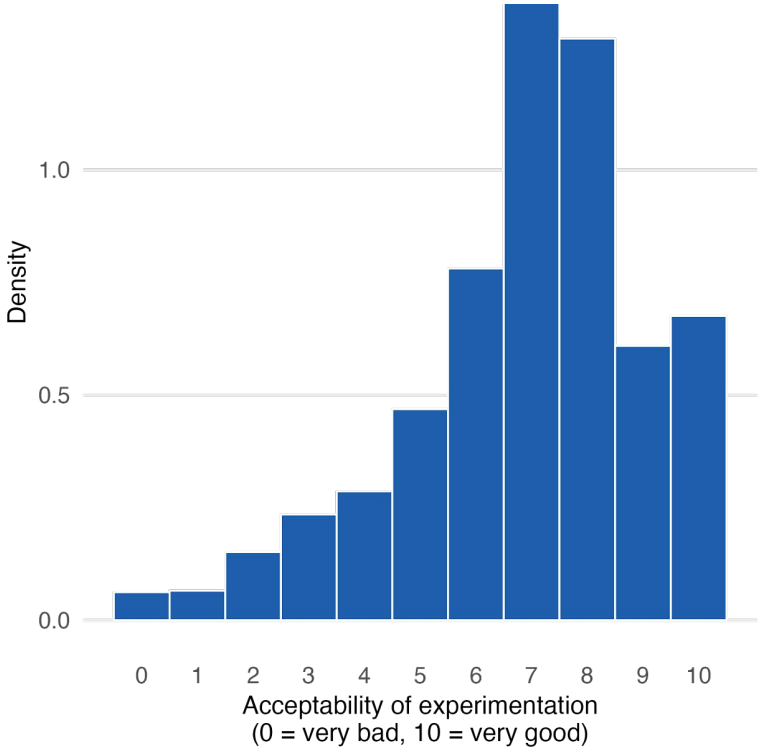
We are working to **bring together researchers, practitioners, policymakers, funders, and other stakeholders** to create a vibrant ecosystem where innovative ideas are tried and can flourish, developing a portfolio of of experimental pilots and exploring how best to integrate AI in this process (e.g., Scientifiq.ai)

Experimenting in mission-driven policy

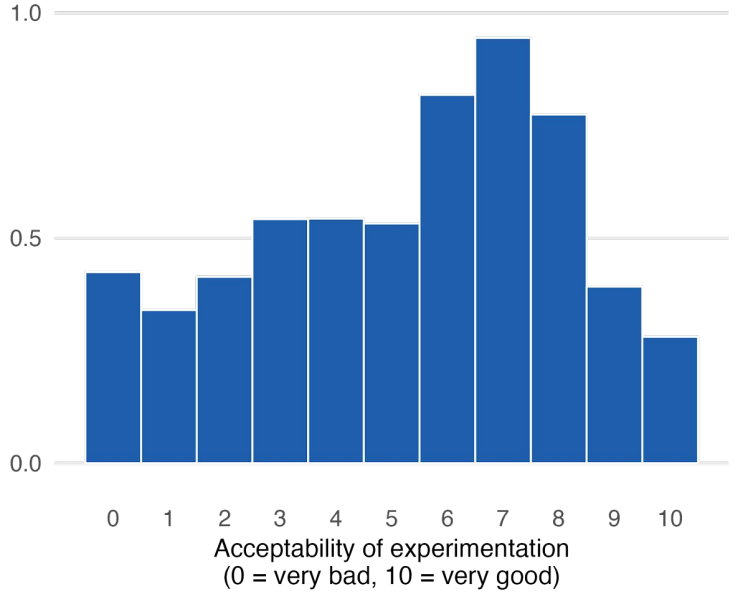
EXPERIMENTING WITH MISSION-ORIENTED INNOVATION: A SIMPLE, FOUR-STAGES SCHEMA		
STAGE	KEY QUESTIONS	EXPERIMENTATION POTENTIAL
1. Defining missions	Who should define missions, and how? Can the process involve the general public, use the right level of expertise, and avoid capture by vested interest?	Testing different ways to reach out to the general public (eg behavioural 'nudges') Experimenting with different approaches to citizens-experts interaction (eg collective intelligence experiments)
2. Convening communities	Who should be involved, and how can we break down silos so different actors can work together? What incentives should relevant stakeholders have?	Testing different ways to bring together actors to collaborate (eg experiments with incentives, structures, funding) Experiment with cross-entity/cross-sector communication channels
3. Choosing instruments	What policy instruments should be used? (eg direct funding, prizes, competitions, tax credits, regulatory changes, procurement, etc.) Which instrument is needed for each goal?	Testing the mechanisms behind policy instruments. Using an 'experimental mindset' to learn from less tangible policy outcomes.
4. Optimising processes	How can each project within a mission best achieve its goal? What tweaks could be applied to improve the project?	Experiment with how funding decisions are made (eg what selection mechanisms reward novel or disruptive proposals?)

Randomised experimentation is more popular than you might think

Respondents' **OWN OPINION**



Respondents' **PERCEPTION OF OPINIONS OF OTHERS**



Collaborating with IGL

Governments and practitioners

Our government members benefit from:

- **Bespoke Support:** Access to tailored assistance to design experimental programmes, develop data science & AI projects, or build experimental cultures.
- **Knowledge Exchange:** Opportunities to learn from other IGL member agencies, and tap into our broader policy and research networks.
- **Capacity Building:** Support in building and enhancing internal capabilities in experimentation, data science, and evidence-based policy-making.
- **Collaborative Projects:** Participate, shape and learn from IGL's portfolio of projects addressing common challenges shared among our government members.

Find out more about how IGL collaborates with governments, agencies and practitioners here.

Researchers

The IGL Research Network has over 250 researchers and supports experimental research in this field through:

- **Creating opportunities for experimental research** (e.g., advocacy, IGL Members, Initiatives, ideas banks, matchmaking)
- **Capacity building and access to timely feedback** (e..g, PhD workshop, Masterclasses online training course, mentoring, CFXS, webinar series, trial designs peer review,)
- **Unlocking funding** (e.g., IGL Grants, Seed grants. experimentation funds, such as EU Innosup and UK Business Basics)

Find out more about the IGL Research network and apply to join

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