Innovation Policy Learning from Korea: Introduction to Innovation Policy Monitoring and Evaluation

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Philippines Day 2
Presenters and Facilitation Team

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- **Yehia Eldozdar**, M&E Specialist, providing technical assistance and capacity building to projects supporting private sector growth through SME development, innovation and entrepreneurship. Supports providing expertise on M&E for documentation of case studies and knowledge sharing activities.

- **Adela Antic**, Consultant. Capacity building specialist focused on knowledge and learning initiatives related to Innovation and Entrepreneurship. Providing support to the program with cross-cutting initiatives and knowledge exchange with external partners, practitioners and multi-sector stakeholders.

- **Grace Morella**, Consultant. Supports knowledge sharing activities and identification and organization of relevant stakeholders in the Philippines.
2. Fundamentals and Practices in M&E of Innovation Policy

Challenges Associated with Technical Characteristics of Innovation Policy

- Diversity and complexity of innovation policy interventions
- Long term uncertainty and maturity of innovation results
- Knowledge spillover vs unintended/indirect benefits
- Limited business population for statistical analysis
- Spillover effect and measuring actual impact
2. Fundamentals and Practices in M&E of Innovation Policy

Challenges Associated with the Broader System, Institutions and Capacity
2. Fundamentals and Practices in M&E of Innovation Policy

- Values and priorities that shape M&E activities, incl. normative and legal frameworks;
- Patterns of interaction among relevant actors resulting from norms and statutes;
- E.g. culture of transparency; explicit rules and authority; insider ownership; focus on learning as well as on accountability.

- Technical dimensions, incl. methodological framework and data gathering schemes;
- More significant role of expertise rather than authority and legitimacy;
- E.g. M&E manuals; data infrastructure; advanced data solutions.

- Determine the “feasibility” of an M&E system and sustained ability to install and operate M&E arrangements;
- Often a combination of both internal and external factors;
- E.g. staffing, budget, innovation system, linkages with academia and industry.
International good practices in M&E

• Case studies
  • Australia – Department of Industry Innovation and Science
  • United Kingdom – Innovate UK
International M&E practices - Australia

• Department has responsibility for industry, innovation and science policy and delivery.

• Also delivers firm support programs through AusIndustry, specialist program delivery division

• Major initiative include R&D Tax Incentive, VC support, Industry Growth Centres, Cooperative Research Centres, Entrepreneurs program, quality infrastructure, Square Kilometer Array project

• **Industry Innovation and Science Australia** - independent statutory board of entrepreneurs, investors, researchers and educators on innovation, research and science matters, and oversees program delivery.

• M&E functions have been built up, tied to Chief Economist office
High level system monitoring – Australian Innovation System Monitor

- Realtime review of innovation performance
- Links to all key local and international data
- Allows international comparisons
- Online, data driven
- Has been developed over time
DIIS evaluation approach

- Sets out how DIIS addresses its responsibilities under the Enhanced Commonwealth Performance Framework
- Definitive message that evaluation is resourced, supported and expected
- High-level leadership and championship of evaluation drives evaluation culture
- Ensure evaluability of all programs with timely and appropriate data collection strategies
- Relevant and trusted data is collected at the right time, for the right purpose; and supports performance monitoring and evaluation
- Enabling cultural change through showcasing practical evaluative tools and resources across the department
How does DIIS prioritise evaluations?

- total funding
- internal priority (importance to Government’s goals)
- external priority (importance to external stakeholders)
- overall risk rating of the program
- track record (previous evaluation, the strength of performance monitoring and lessons learnt).
So is this best practice?

- Within the Australian government, it is seen as a leader
- 2017 assessment found issues
  - Staff think evaluations are an important part of comprehensive program delivery and policy work
  - But not core business and not part of their daily duties.
  - Often under-resourced and given lower priority
  - Executives generally do not use evaluation reports to improve policies, services or programs
  - Evaluation plan too rigid, involved programs which were closing and had little ongoing relevance
  - Little apparent appetite for fast failure
  - Access and dissemination of evaluation results within and outside the department is low
  - No systematic mechanism for follow up on the implementation of recommendations
Policy review – the innovation system and government support

- Industry Innovation Science Australia
- Asked to review the effectiveness of the Government’s ISR investments.
  - Duplications, gaps, alignment of policies across the system
- 3 core recommended actions
  - whole-of-government ISR priorities that are used to drive investment decisions
  - a 10-year investment plan coordinated at the whole-of-government level and has effective evaluation processes
  - an investment plan that is strategically balanced across the government’s portfolio of investments to ensure returns over the short, medium and long term
- Report was critical of various evaluation practices, especially for industry support
Recent activity to improve M&E performance

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Published departmental Evaluation Strategy</td>
<td>Sets out how DIIS addresses its responsibilities under the Enhanced Commonwealth Performance Framework under the PGPA Act</td>
</tr>
<tr>
<td>Evaluation Plan with scheduled evaluation activities</td>
<td>Definitive message that evaluation is resourced, supported and expected</td>
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<tr>
<td>Senior executive level evaluation champion</td>
<td>High-level leadership and championship of evaluation drives cultural change</td>
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<tr>
<td><strong>Evaluation Ready</strong> process to establish an evaluation strategy for programs early in their lifecycle</td>
<td>Ensure evaluability of all programs with timely and appropriate data collection strategies</td>
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<tr>
<td>Data collection advice</td>
<td>Relevant and trusted data is collected at the right time, for the right purpose; and supports performance monitoring and evaluation</td>
</tr>
<tr>
<td>Centralised Evaluation Unit responsible for conducting and managing evaluations</td>
<td>Definitive message that evaluation is resourced and supported</td>
</tr>
<tr>
<td>Evaluation Fair</td>
<td>Enabling cultural change through showcasing practical evaluative tools and resources across the department</td>
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**Evaluation Ready** approach

Builds evaluation into program design at its start, incorporating three main elements

1. Develop program logic
2. Develop data matrix
3. Program evaluation strategy

Notes: Amended from the department’s program logic model template
United Kingdom – innovation M&E

The UK Example: Central Guidance, UKRI and ROAMEF

- Governance: Grounded in the national innovation system (NIS): M&E of Innovation Policy is led/coordinated by the innovation agency UKRI
- Data & Methods: Broad understanding of innovation; top-down guidance supported with bottom-up practices: the “Green Book”, i.e. The Central Government Guidance on Appraisal and Evaluation; the “Magenta Book” (Guidance for Evaluation)
- Capacity & Resources: Benefiting and benefitted from the innovation ecosystem actors; evaluators are largely external to the interventions; allocated budget for subject programs; competitive selection of evaluators
Innovate UK

• National innovation agency
• Design and delivery (not policy)
• Key initiatives include
  • Knowledge Transfer Network (KTN)
  • Knowledge Transfer Partnership
  • Catapult Applied Research Centres
  • Industrial Strategy Challenge Fund
  • Innovation Loan
  • Small Business Research Initiative
  • Smart innovation grant

• Annual budget of around US$1.15B
Evaluation in Innovate UK; The history

• Ad hoc, single-point-in-time evaluations
• Generally launched some years after projects had finished
• Limited use of a control group
• Economics and Performance team formed in 2013
  • Key initial focus of implementing a robust evaluation framework across all our activities
  • Developed into new evaluation framework, setting out our guiding principles in designing and implementing evaluation.
  • Performed a prioritisation exercise, to determine which areas to initially focus on.
Evaluation challenges – paucity of data

• Problem:
  • Innovation grant programmes support a relatively small number of participants.
  • Where programmes have different strands or segments, sample size issues can be significant.

• Example
  • 2015 Evaluation of Smart used a two year cohort, attaining 293 treatment, 189 control. Sufficient for headline analysis, but breaking down to different segments we quickly lost sample size.

• Solutions:
  • Track cohorts in real time to enhance data quality, and encourage participation.
  • keep in touch with sample between survey waves.
  • Use cohorts from longer time periods to increase sample
Evaluation challenges – low observability

Many outcomes and impacts of innovation support are not well documented.

- Primary output – knowledge - can be embedded in innovation project outputs (e.g. products)
- It also moves with people, to different companies, industries, and applications, creating benefits elsewhere.
- These spillover impacts are impossible to predict and difficult to track, observe, and measure

Solutions

- In the evaluation of Smart, direct beneficiaries were asked whether any customers, suppliers, or competitors would have benefited from the project.
- Asked what form those benefits took, to build a typology of different spillovers.
- Asked for contact details to interview the indirect beneficiaries, to follow up.
Evaluation challenges – fluidity

• Problem:
  • Companies are fluid: they change frequently and unpredictably.
  • Introduction of new products or processes, entry to new markets, changes in strategy or leadership, mergers and acquisitions

• Solutions:
  • Innovate UK have been using external data to gain a better understanding of changes in company ownership and exit strategies.
  • Provides a clearer picture as to how companies we support change over time, and can tie in with evaluation activities to understand whether grant support impacts survival or company structure.
  • Looking at advanced analytical techniques to dynamically analysis internet data to look for product launch activity
Evaluation challenges – skewed and lagged effects

• **Problem:**
  - Statistical models often assume a ‘Normal’ distribution of observations around a mean.
  - Impacts of innovation tend to be highly skewed towards a small number of very successful projects with a long tail of low or no impact projects.
  - Many evaluation techniques seek to estimate the average treatment effect; the mean impact of an intervention on a participant, but this profile of impacts can be difficult to capture in sample-based analysis.
  - Impacts also happen over many years, generally long beyond the duration of support.
  - In initial years following support, returns can appear to be low or even negative.

• **Solutions:**
  - Innovate UK evaluations span long time periods, from the start of projects to at least 3 years beyond their end.
  - Recent evaluation of support for argi-tech conducted fieldwork 6 years after the programme started, intending to go back again after 8. Initial survey found only ¼ of projects had completed, so have moved second wave back a further 2 years.
Evaluation challenges – attribution

• Problem:
  • Innovation support acts as part of a complex science and innovation system
  • Multiple actors and programmes at national and sub-national levels
  • Companies may receive support from several programmes across multiple organisations
  • Attribution of any observed impact to any single intervention can be very difficult, with each programme being necessary but not sufficient to achieve outcomes.

• Solutions:
  • Surveys can ask about other forms of support received, although self-reported information is likely to be flawed and incomplete.
  • Greater linking of administrative data would allow for a more detailed analysis.
  • Innovate UK have linked data to others programmes delivered by BEIS or the British Business Bank to look at the overlap of support.
Summary – observations from Innovate UK

• Evaluation should be designed into programmes from the beginning.
• Evaluation of innovation support is difficult, with several sometimes intractable challenges. This doesn’t mean evaluation shouldn’t be attempted – a mixed methods approach is usually most suitable.
• Data is key – know what data will be required for the evaluation, and ensure sufficient data collection processes are in place.
• Sample size is fundamental – design an evaluation which enables a sufficient sample size in both the treatment and control group.
• Don’t get too preoccupied with a single number – evaluation findings will always come with some gaps and uncertainties.
• Survey data is usually required, but is also imperfect. Complement and verify this by linking your evaluation data to third-party data sources.
M&E in action - Catapult Centres

9 Centres - Enhance business access to leading-edge technology and expertise

• Reach into the research base for world-leading science and engineering
• Undertake collaborative applied research projects with businesses
• Undertake contract research for businesses
• Be strongly business-focused with a highly professional delivery ethos
• Critical mass of activity between business and research institutions
• Provide skills development at all levels.
• Around $320m direct funding per annum
Catapult Centres logic model

Inputs
- Industry Collaboration
- Funding
- Facilities
- Policy
- Capability Development

Activities
- New technologies, new partnerships
- Dissemination of knowledge
- Number of new feasibility studies / prototypes

Outputs
- Number of new businesses or spin outs created
- Increased private R&D expenditure
- Increased and accelerated translation of research into industry innovation

Intermediate Outcomes
- Value of IP income or from licenses
- Business growth (increased sales or turnover)
- Employment Outcomes

Later stage Outcomes
- Increased sector growth / Gross Value Added
- Increased productivity
- Wider societal benefits

Impacts
Complex evaluation challenge

• Multiple activities (providing infrastructure, undertaking R&D, enabling networking) across different levels of the system (individuals, firms, research entities) on mix of projects (confidentiality)

• Absence of agreed tested approaches for evaluating the impact of investment in the type of activities that Catapults undertake

• Challenges include timescales, baselines, attribution, assessing additionality
Catapult evaluation approach

Theory Based Evaluation

Contribution Analysis
To understand Catapults' contribution to changes in businesses and the wider sector and innovation system

Quantitative Methods
- Measure the impact on beneficiaries, such as business growth

Qualitative Methods
- Understand how the Catapult has achieved benefits, including spillovers

Difference-in-Differences
- Trend Analysis
- Sector Modelling

Expert Panel – Review and validate evaluation findings

Case Studies
- Stakeholder Interviews
# Catapult methodology

<table>
<thead>
<tr>
<th>Main Evaluation Methods</th>
<th>Catapult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Studies</td>
<td>✔</td>
</tr>
<tr>
<td>Surveys</td>
<td>✔</td>
</tr>
<tr>
<td>Interviews with key stakeholders</td>
<td>✔</td>
</tr>
<tr>
<td>Econometric analysis via difference-in-differences</td>
<td>✔</td>
</tr>
<tr>
<td>Sector modelling through trend analysis or before-after analysis</td>
<td>✔</td>
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Catapult Monitoring – what data is collected?

What type of indicators are used, and why?

<table>
<thead>
<tr>
<th>Data item/indicator</th>
<th>Relevance to impact measurement</th>
</tr>
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<tbody>
<tr>
<td>Collaborative R&amp;D funding, including that leveraged from the</td>
<td>Funding information can help to evaluate the input and activity sections of the logic model.</td>
</tr>
<tr>
<td>private sector</td>
<td></td>
</tr>
<tr>
<td>Commercial income</td>
<td></td>
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<tr>
<td>Other public funding received</td>
<td></td>
</tr>
<tr>
<td>Sales Order Book (ytd) (contracted work secured but not yet</td>
<td>To understand the longer term stability of the Catapult.</td>
</tr>
<tr>
<td>delivered)</td>
<td></td>
</tr>
<tr>
<td>Utilisation of testing facilities (if applicable)</td>
<td>A key activity in the logic model of some Catapults and an aim behind setting up Catapults.</td>
</tr>
<tr>
<td>Spin-outs created</td>
<td>This information can be collected to evaluate wider impacts of the Catapult to their sector and the innovation system. Including dissemination, reach and taking a pioneering role.</td>
</tr>
<tr>
<td>New processes and products developed</td>
<td></td>
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<tr>
<td>People benefitting from skills development</td>
<td></td>
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<tr>
<td>International collaborations</td>
<td></td>
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<tr>
<td>Academic or trade papers published</td>
<td></td>
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<tr>
<td>Booked value of Intellectual Property</td>
<td></td>
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<tr>
<td>Patents registered</td>
<td></td>
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</table>

What type of firm level data is collected and why?

<table>
<thead>
<tr>
<th>Data item</th>
<th>Purpose for collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Name</td>
<td>To contact businesses for case studies and surveys.</td>
</tr>
<tr>
<td>Trading and registered address</td>
<td>To understand the link between place and catapult impact.</td>
</tr>
<tr>
<td>Contact name and details (e-mail, phone etc)</td>
<td>Business surveys achieve a higher response rate if a named contact is available.</td>
</tr>
<tr>
<td>Companies House Number\textsuperscript{15}, Unique Taxpayer Reference (for unregistered businesses)</td>
<td>In order to match with ONS data for long-term impact assessment.</td>
</tr>
<tr>
<td>Staff (FTE)</td>
<td>To understand the size of businesses engaged in Catapult activities.</td>
</tr>
<tr>
<td>Turnover (if trading)</td>
<td>As above</td>
</tr>
<tr>
<td>Type of business</td>
<td>Whether from the private sector, public sector, another Catapult, an academic organisation, an international organisation or other.</td>
</tr>
<tr>
<td>Type of project / relationship (e.g. collaborative, contracted)</td>
<td>To better understand type of projects being undertaken.</td>
</tr>
</tbody>
</table>
Monitoring – lots of data but what about impact?

OUR IMPACT JOURNEY
2013 TO 2020

14,750
INDUSTRY COLLABORATIONS

8,332
SMES SUPPORTED

5,108
ACADEMIC COLLABORATIONS

4,712
EMPLOYEES IN 2019

OVER £1.3BN
OF RESEARCH AND DEMONSTRATION FACILITIES UNDER MANAGEMENT

1,218
INTERNATIONAL PROJECTS

R&D INVESTMENT
TOTAL
£744M

2019-20

£236M
CORE GRANT INVESTMENT IN CAPABILITY

£332M
ATTRACTS COMMERCIAL R&D INVESTMENT IN PROJECTS

£134M
COLLABORATIVE R&D WINS

£224M
CR&D LEVERAGE
Conclusions

• Monitoring and evaluation is challenging in innovation policy

• Established countries like Australia and the UK still struggle to get it right
  • Methods – what to do
  • Practice – how to do it – and do it well
  • Culture – getting others to recognize its value

• Developing good practices and systems takes time, resources
Open discussion

Any questions, comments, reflections
Please feel free to reach out to us via email yeldozdar@ifc.org or Jhill@worldbank.org to continue our discussion!