Horizon 2020 Policy Support Facility

Evaluation of Business R&D Grant Schemes: behavioural change, mixed-method approaches and big data

European RTD Evaluation Network
November 2018

Reflections on Final report findings and learning experience

The Mutual Learning Exercise (MLE) on **the evaluation of business R&D grants schemes in European countries-** an overview

- This MLE on the evaluation of business R&D grants schemes carried out from April 2017 to June 2018.
- It was a follow-up to the MLE on 'Ex-post evaluation of business R&I grants schemes' ran in 2016.

- The MLE aims:
  - To improve the exchange of information, mutual learning
  - To identify and disseminate good practice in assessing R&D grants among the participating countries
  - To improve systems for the ex-post evaluation of business R&I grant schemes.

MLE Scope - 3 main areas

1. The potential of big data – such as data linking and new sources of data
2. Assessing the effect of funding on the behaviour of companies
3. Combining qualitative and quantitative evaluation approaches

Characteristics of MLE participants

MLE participants:

policy-makers and public agencies from 12 countries

- Austria
- Belgium
- Croatia
- France
- Germany
- Lithuania
- Norway
- Slovenia
- Spain
- Sweden
- Turkey
- UK

Challenges faced when designing and conducting evaluation of R&D grants

- R&D grants are used to stimulate investments into research and innovation by private companies;
- Main challenges in assessing their effects quantitatively or qualitatively are related to:

1. skewed effects;
2. lagged effects;
3. paucity of data;
4. low observability (including spill-overs);
5. fluidity of companies;
6. attribution.

Fluidity of companies, skewed & lagged effects

- Heterogeneity of companies over time (at the beginning and at the end of policy scheme)
- Heterogeneity of companies that got support (size, strategy, organizational structure, etc.)
- Diverse impact of innovation support; a small number of highly successful projects
- Impacts, on other actors in the innovation system may occur over many years

Skewed responses to public support & lagged effects

Low observability & paucity of data

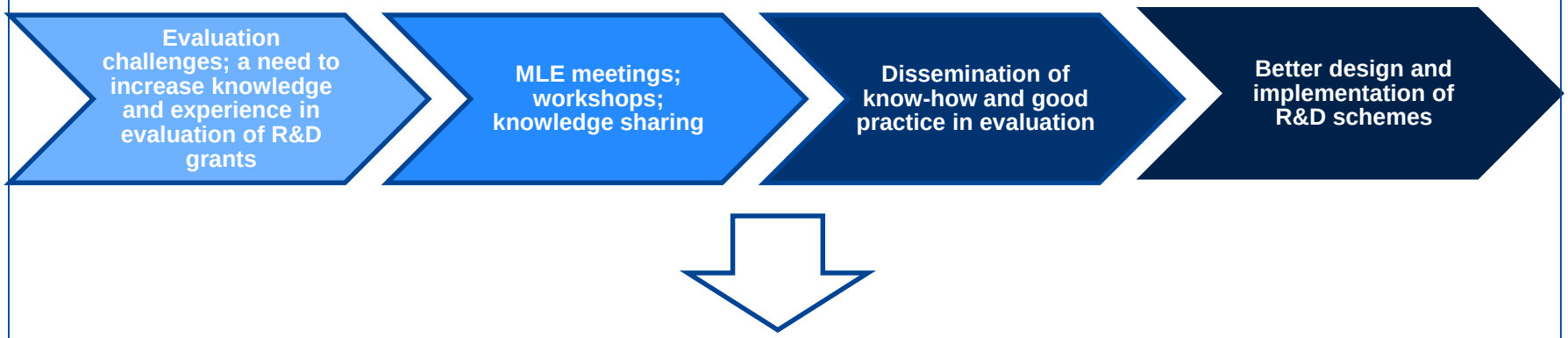
- Not all the outcomes and impacts of innovation support are documented;
- Intangible outcomes (e.g. skills) are difficult to capture
- Spillover effects are difficult to measure, may occur with some time lag;

Attribution

- The attribution of impact to any single intervention can be very difficult;
- The direct outcomes of support receives as an R&D grant may be difficult to distinguish from other forms of support;
- Support in a form of R&D grants is an element of a complex STI system (multiple actors and programmes at supra-national, national, regional levels);
- Support may be obtained simultaneously, successively or in an overlapping combination.

MLE on the evaluation of business R&D grants schemes in European countries

- Learning – a way to cope with challenges faced when designing and conducting evaluation of R&D grants



Learning process

Learning process: how it happened?

- 3 interactive workshops (country visits): a platform for sharing knowledge and experience – Oslo (Norway), Stockholm, (Sweden), London (UK)
  - Comparing how ministries and agencies in different countries are evaluating business R&D grant schemes and other schemes for supporting companies' R&D and innovation
  - Elaboration on the methods used in recent and planned evaluations (breakout sessions)
  - Refining key messages would be taken back home

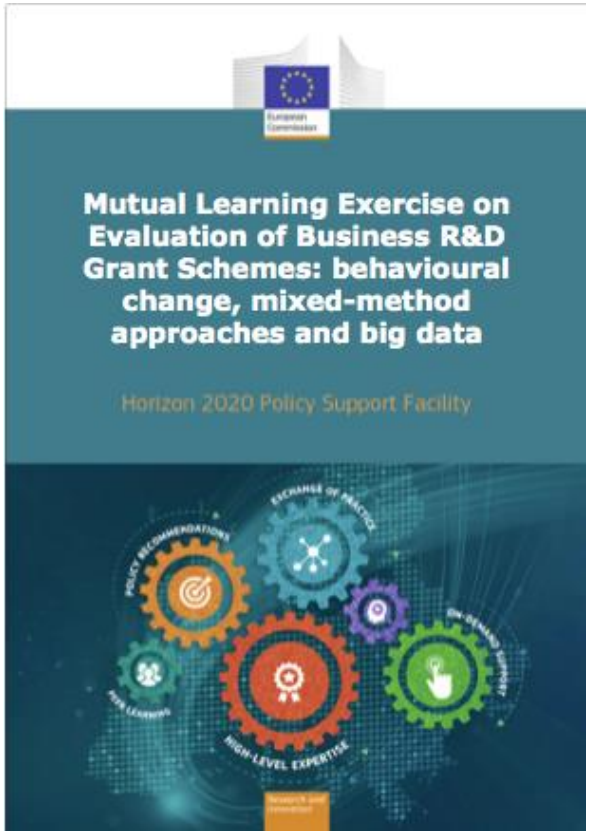
- The 'ex-post survey'- feedback on key messages and lessons learned

Access to main findings

- **Final report**
- **3 thematic reports:**

1. Big data: data linking, new data sources and new data analytics methods
2. Capturing Behavioural Change
3. Combining Mixed Approaches to Evaluation

- https://rio.jrc.ec.europa.eu/policy-support-facility/mle-evaluation-business-rd-grant-schemes



The PSI Directive and Research Data

European RTD Evaluation Network Meeting
November 2018

The Digital Single Market initiative – the vision on "data"

Digital SINGLE Market:

→ "Free Flow of Data" (across borders)

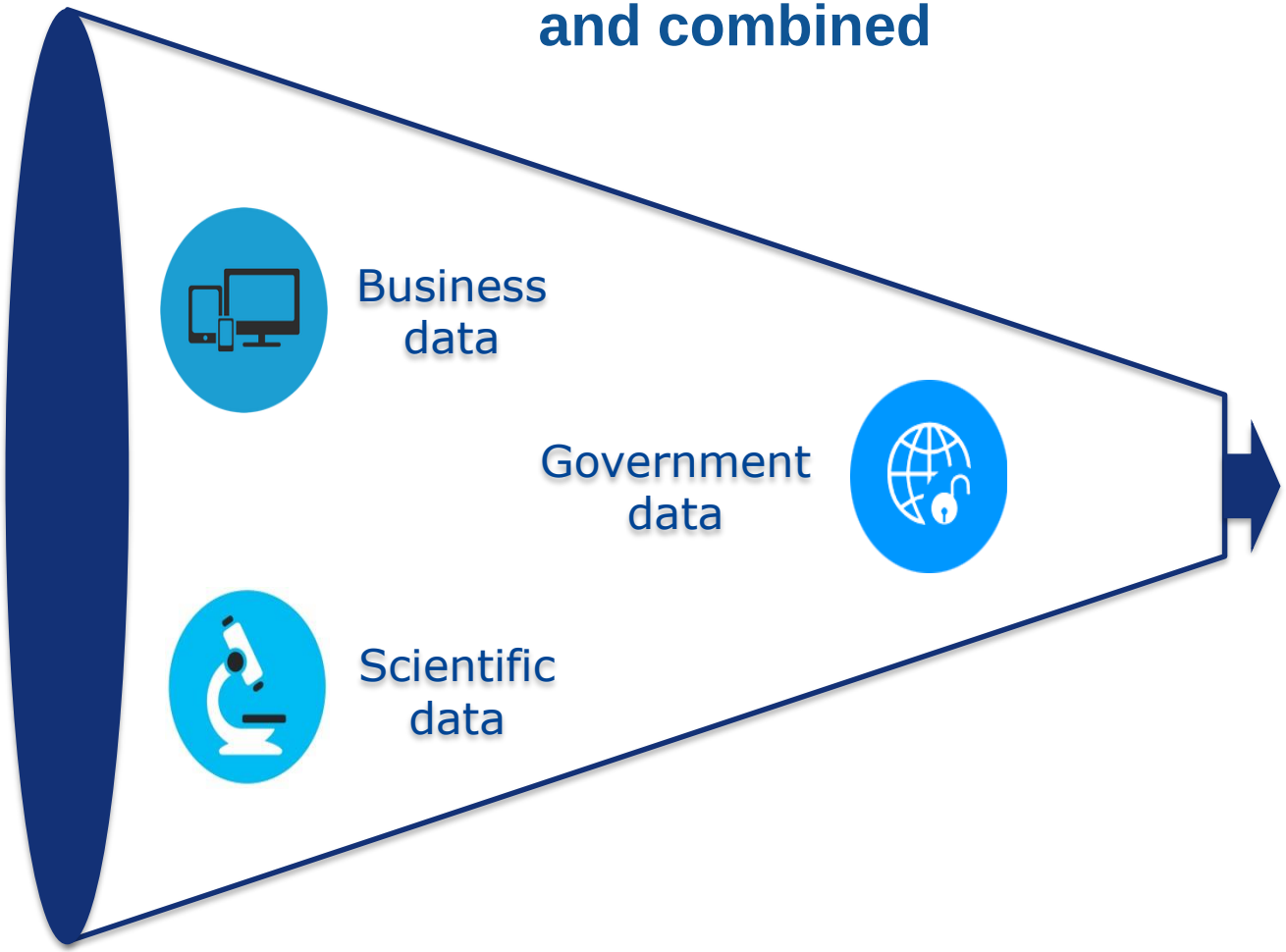
DIGITAL Single Market:

→ Availability & free flow of data (across organisations)/
= Open data (PSI, OA) & "B2B data-sharing"
= "Common European data space"

Choices made:

- Limitation to non-personal data (GDPR);
- Open discussion to business data;
- Focus on IoT data?

The vision: Creating a space in which data of different provenance can be easily be (re)used and combined



Innovation & growth/ solutions to societal challenges with the help of Big Data & AI

European Commission

Adopted

25/4/2018

Public sector and publicly funded data

Private sector data

Research data

Proposal for a revision of the Directive on the reuse of public sector information

Draft Guidance on private sector data sharing in B2B and B2G contexts

Update 2012 Recommendation on access to and preservation of scientific information

2018 DATA PACKAGE

Different policy instruments for different types of data

#dataeconomy #opendata

What the "Data Package" contains

A "chapeau" Communication [COM(2018)232];

I) More Open (government) Data:
A proposal for a recast of the Public Sector Information Directive 2003/98/EC – COM(2018)234);

II) More "sharing" of private sector data:

- "Principles" on business-to-business data transfers (with a focus on IoT data) (in COM (2018)232);
- "Principles" on access for public bodies to private sector data (in COM (2018)232);
- Technical guidance on sharing of private sector data (SWD(2018)125 final)
- Evaluation of the Database Directive

II) More Open Access:
An update of the Recommendation to MS on Open Access;

I) More Open (government) Data: Proposal for a recast of the PSI Directive

Main elements of the proposal:

- Creation of a high quality public data infrastructure:
  Certain "high value" public data should be available for free and through APIs;
- Obligation on MS to make available research data in Open Access (interplay with revised Recommendation to MS on the 'how to');
  research data re-usable, also for commercial purposes (insofar as already accessible via repositories);
  re-use of research data to be free of charge;
- Ensure equal access for all – no exclusive agreements on access to public data with private companies.

II) More "sharing" of private sector data: B2B situations

How to improve the flow of data in B2B situations?

- 2017 policy Communication on questions of data access, rights on data (limited to non-personal and "IoT" data);
- 2018 Principles:
  Contractual freedom of companies to share or not to share; principles to guide contractual negotiations so that markets for **IoT data** and products remain fair and competitive:
  - Transparency in contracts on access and use of data;
  - Recognition of different roles in shared value creation;
  - Respect for each other's commercial interests;
  - No distortion of competition;
  - Minimised data lock-ins.
- Guidance document accompanying the principles/ Support Centre (as of 2019)

II) More "sharing" of private sector data: B2G situations

- 2017 policy Communication on questions of data access, rights on data identifies question of "access for public interest and scientific purposes"
- 2018 Principles: Private law contracts as the basis of data delivery from companies to public sector bodies, but suggesting that such delivery take place
  - at preferential terms

  against promise
  - to respect a purpose limitation principle (no "once-only");
  - not to undermine commercial exploitation of the data

  and to proceed in a transparent manner.

  Preferential nature of the terms to be considered against public purpose.

Open Access in the Data Package

- PSI Directive
- Revision of 2012 Recommendation

European Commission

Proposal for a PSI Directive (recast) and research data

In the DSM Mid-term review, the Commission promised to adopt measures to enhance the availability of public and publicly funded data by spring 2018.

The proposal adopted on 25 April as part of the 'Data Package' extends the scope of the PSI Directive to publicly-funded research data already accessible via repositories (art. 10).

In addition, it requires the Member States to adopt national Open Access policies to further encourage the availability and re-use of research data.

Re-use of research data will be free. The provisions of the PSI Directive will apply (e.g. licensing, formats, non-discrimination) with some exceptions (i.e. request procedure – Article 4).

European Commission

Article 10: availability and re-use of research data

1. Member States shall support the availability of research data by adopting national policies and relevant actions aiming at making publicly funded research data openly available ('open access policies'). These open access policies shall be addressed to research performing organisations and research funding organisations.

2. Research data shall be re-usable for commercial or non-commercial purposes under the conditions set out in Chapters III and IV, insofar as they are publicly funded and whenever access to such data is provided through an institutional or subject-based repository. In this context, legitimate commercial interests and pre-existing intellectual property rights shall be taken into account. This provision shall be without prejudice to point (c) of Article 1(2).

The PSI proposal…….

- builds on the Commission's initiatives in the area of open access and open science, such as the Recommendation on access to and preservation of scientific information, which was revised 15 at the same time as the PSI Directive.
- complements the actions supporting the development of tools and services underpinning Open Science and promoting a pan-European access channel to the resources in the context of the European Open Science Cloud.

The updated Commission Recommendation on access to and preservation of scientific information

EUROPEAN
COMMISSION

Brussels, 25.4.2018
C(2018) 2375 final

COMMISSION RECOMMENDATION

of 25.4.2018

on access to and preservation of scientific information

European Commission

The updated Commission Recommendation on access to and preservation of scientific information

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European Commission

The revised Recommendation of 2018

- Still a soft law measure
- Title unchanged
- Technical update required to fit today's standard research practices bases on Open Science (OS), and to reflect the most recent developments in EU policies
- Announced in European Cloud Initiative (COM(2016) 178 final)
- Discussion at the 5th meeting of the EC Expert Group on National Points of Reference (NPRs) in December 2017
- Joint exercise DG CONNECT & DG RTD
- Interservice Group and interservice consultation

The revised Recommendation of 2018

- *Open access to scientific publications*
- *Management of research data including open access*
  (2012: open access to research data)
- *Preservation and re-use of scientific information*
- *Infrastructures for open science (2012: e-infrastructures)*
- *Skills and competences new***
- *Incentives and rewards new***
- *Multi-stakeholder dialogue*
- *Structured coordination and follow-up*

The main changes (1/10)

OA to scientific publications (section 1)

- *As a result of Member States' policies or action plans, all scientific publications resulting from publicly-funded research are made available in OA as from 2020 at the latest;*
- *Whatever the channel of publication (scientific journal, digital infrastructure, multimedia channels, or any new and experimental methods of scholarly communication), OA to publications shall be granted as soon as possible, preferably at the time of publication, and in any case no later than six months after the date of publication (12 months for social sciences and humanities);*
- *Licensing terms used on the market do not unduly restrict text and data mining (TDM) of publications;*
- *When entering into contractual agreements with publishers, researchers retain the necessary intellectual property rights to comply with the OA policy requirements (notably for self-archiving and re-use through TDM);*

The main changes (2/10)

OA to scientific publications (sections 1-2)

- *Transparency: Information is published about agreements between (groups of) public institutions and publishers on the supply of scientific information, in order to enhance market transparency and fair competition (incl. 'big deals' and 'offsetting deals');*
- *Widening and innovation : Innovative companies, in particular SMEs, independent researchers (e.g. citizen scientists), the public sector, the press and citizens at large have, in a transparent and non-discriminatory manner, the widest possible access to scientific publications of the results of research that receives public funding in view of enabling innovation, empowering the public sector and informing citizens;*
- *Aligned policies: Research funding institutions and academic institutions managing/receiving public research funding set their own policies, which are aligned: funding, monitoring, guidance, transparency, management of Intellectual Property Rules etc.*

The main changes (3/10)

Management of research data, including OA (section 3)

- *Data management planning becomes a standard scientific practice early in the research process when data is generated or collected, including through the requirement of Data Management Plans(DMPs);*
- *Research data that results from publicly funded research becomes and stays findable, accessible, interoperable and re-usable ("FAIR principles") within a secure and trusted environment, through digital infrastructures (including those federated within the European Open Science Cloud (EOSC), where relevant)*
- *Research data is open by default unless this is not possible or is incompatible with the further exploitation of the research results ("as open as possible, as closed as necessary"); privacy, security, trade secrets taken into account;*
- *Taking into account technological developments (including of dynamic (real-time) data), licensing terms used on the market do not unduly restrict TDM.*

The main changes (4/10)

Management of research data, including OA (sections 3-4)

- Widening and innovation : same as for publications: *innovative companies, in particular SMEs, independent researchers (e.g. citizen scientists), the public sector, the press and citizens at large have the widest possible access to research data of the results of research that receives public funding;*
- Aligned policies : Same as for publications: *Research funding institutions and academic institutions managing/receiving public research funding set their own policies: funding, monitoring, guidance, transparency, management of Intellectual Property Rules etc. e.g. persistent identifiers for datasets.*

The main changes (5/10)

Preservation and re-use (section 5)

- *Policies for HEIs: Call for national policies/action plans and for academic institutions receiving public funding to develop their own*
- *Unique identification (interlinking of research outputs, researchers, their affiliations and funders, and contributors) is promoted through a wide range of persistent identifiers, in order to enable findability, reproducibility and long-term preservation of the research results;*
- *Machine-readable licensing systems and conditions are in place, compatible with already existing open licenses, which allow the re-use of scientific information resulting from publicly-funded research in accordance with and without prejudice to applicable copyright legislation, in order to enable legal re-use and preservation;*

The main changes (6/10)

Infrastructures for Open Science (sections 6-7)

- *Define clear policies for infrastructures including promoting their integration with the EOSC*
- *Resources are earmarked, leveraged and built to be efficient and to innovate while fostering competition within the internal market;*
- *Quality and reliability are ensured, including through the use of widely recognised certification mechanisms, specifications and standards;*
- *Researchers have an increased access, in a transparent and non-discriminatory manner, to research resources and services for storing, analysing, sharing, and re-using scientific information, including through the EOSC, when available;*
- *Through the use of additional indicators and metrics, infrastructures are fit to collect information that underpins the monitoring and assessment of openness and open science, as well as of research and career evaluation;*
- *Member States ensure synergies among national infrastructures with the EOSC and other global initiatives (definition of standards, interoperability etc.)*

The main changes (7/10)

Skills and competences (section 8)

- *Define clear national policies/action plans for skills and competences regarding scientific information*
- *Training and education are provided about open access, data research management, data stewardship, data preservation, data curation and open science, as part of the higher education and training system, at all career stages, and they reach on-the-job best practice in the industry;*
- *Promotion and/or implementation of advanced-degree programmes of new professional profiles in the area of data handling technologies are provided;*
- *Development and training of data-intensive computational science experts are supported, including for data specialists, technicians and data managers.*

The main changes (8/10)

Incentives and reward (section 9)

- *Clear national policies/action plans to adjust recruitment and career evaluation system such that:*
- *The academic career system supports and rewards researchers who participate in a culture of sharing the results of their research, in particular by ensuring early sharing and OA to their publications and other research outputs;*
- *Institutions responsible for managing public research funding and academic institutions that are publicly funded assist in implementing national policy by putting in place mechanisms enabling, measuring and rewarding the sharing of scientific information;*
- *Research and career evaluation systems are enriched through the introduction of additional indicators and metrics that can inform assessment on openness, including but not only on the broader social impact of research and at the individual level of a researcher ('new generation metrics').*

The main changes (9/10)

Multi-stakeholder dialogue on open science at national, European and international level (section 10)

- Introduction of "on open science"!
- *Member States should participate in multi-stakeholder dialogues on the transition towards open science at national, European and international level on each of the issues addressed in points 1 to 9;*
- *These dialogues strengthen a linked open science technological environment that covers all research outputs from all phases of the research life cycle (data, publications, software, methods, protocols, etc.);*
- *A systemic change towards open science is gradually achieved and includes, beyond the technological change and efficiency, the principle of reciprocity, cultural change among researchers, as well as institutional change in research within academic institutions and funders towards open science, including where applicable issues such as research integrity and ethics.*

The main changes (10/10)

Structured co-ordination of Member States at EU level
(section 11) incl. information to the Commission (section 12)

- Minor modifications
- Principle of reporting by national points of reference kept
- *Member States should inform the Commission 18 months from the publication of this Recommendation* i.e. October 2019

Other changes

- Inclusion of recent references (e.g. Recitals)
- Formatting and editing e.g. more straightforward language

The expected impact and next steps

The expected impact

- Specificity: the Recommendation focuses on the entire ecosystem of scientific information
- 2018 C(2018) 2375 final as an even more powerful policy instrument that is fit for purpose
- Translations available in all official EU languages for tailored reference at national level
- Compatibility with Horizon Europe
- Complements the PSI by clarifying implementation for research data

The next steps

- A new compass for Member States that is immediately ready-to-use.