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LIMITE

ERAC

WORKING PAPER

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MEETING DOCUMENT

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<th>From:</th>
<th>ERAC Secretariat</th>
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<tr>
<td>To:</td>
<td>ERAC (European Research Area and Innovation Committee)</td>
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<tr>
<td>Subject:</td>
<td>PowerPoint presentation by the Commission: &quot;Economic case for R&amp;I, Horizon 2020 Interim Evaluation emerging results, and foresight&quot;</td>
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Delegations will find attached the PowerPoint presentation "Economic case for R&I, Horizon 2020 Interim Evaluation emerging results, and foresight" given by the Commission concerning the item 5.1 of the ERAC plenary agenda of 16-17/03/2017.
Economic case for R&I, Horizon 2020 Interim Evaluation emerging results, and foresight
Towards FP9: the economic case, learning from the past & projections of the future

- **Stakeholder consultation**

  - **Horizon 2020 Interim Evaluation**
  - **Foresight**
  - **Economic case of R&I**

  **High Level Group chaired by Pascal Lamy**

  **Impact Assessment**

  **Proposal for the successor Framework Programme**

  - **EU budget under intense scrutiny**: return on investment, impact on the ground, output-based funding, flexibility ...
  - **Challenging political climate**: EU added value; UK; EP elections
  - **Strong steer from Juncker priorities and objectives of Commissioner Moedas (3 Os, EIC); simplification...**

**Research and Innovation**
Economic case: meta-analysis finds positive and significant returns to R&D investment

- 62% of economic growth in EU 1995 – 2007
- An increase in R&I investment of 0.2% of GDP would result in an increase of 1.1% GDP in productivity growth
- Private returns 10% - 30%

Source: RTD.A4 based on data from FP INTAN-INVEST project and EIB
But there is a "productivity paradox"

Source: OECD, STI Outlook 2016

Source: EC, SRIC Report 2016
...which can be explained by the following factors:

**Insufficient structural change**

**More negative spillovers due to fast pace and high complexity of innovation dynamics**

- Network and scale effects: "winner takes it all"
- Erosion effects in R&I investments in the absence of complementary investments in human capital
- Fast creative destruction that do not allow incumbents sufficient time to benefit from the fruits of innovation, as new companies enter the market

**Low innovation diffusion**

- Celerity of change
- Complexity of innovation process
- Concentration of innovation benefits
- Consumers as innovators
The rationale for public R&I funding

Traditionally:
1. Address market failures
2. Maximise positive spillovers

Now (in addition to traditional arguments):
1. Shape/ create markets
2. Support impacts all along the research-innovation process: from basic research to market-creating innovation
The economic impact of public R&I funding

Econometric studies
- + impact on productivity and positive return
  10%- 15%

Case studies
- Rate of return 20% - 50%

Macro-economic modelling
- Some studies show high economic returns
- Work on QUEST and other models on-going
The impact of EU R&I funding (FP7)

- Large and positive economic impacts
  - Growth: €50bn led to €500bn estimated effects from innovations, new techs/products
  - Jobs: 130000 direct (10 yy) and 160000 indirect (25 yy)

- Better conditions for business R&I investments
  - Improved scientific excellence and skills
  - Leveraged industrial participation
  - Improved knowledge flows and networks
  - Large research infrastructures

- Addressed societal challenges
  - Supported the creation of new tech markets
  - Boosted SME's to do groundbreaking innovation
  - Enabled impactful public-private partnerships
First conclusions on the economic case:

- The economic impacts of public R&I funding are large and significant, as R&I investments are key drivers of productivity and economic growth and the creation of more and better job opportunities.

- Public R&I policy is fully justified by market failures, positive spill-overs and need to shape/create markets for innovation.

- To maximize impact, public R&I policy needs to target faster and more effective creation and diffusion of innovation.
Horizon 2020 interim evaluation - The "Evaluate first" principle

Evaluation results to feed into the decision-making cycle and new policy developments

- Ex-ante impact assessment of Horizon 2020
- Ex-post evaluation of FP7
- Review of EIT
- Mid-term evaluations of JTIs and the Article 185 initiatives

Evidence base

- Interim Evaluation of Horizon 2020

Evidence base

- Lamy report
- MFF proposal
- Ex-ante impact assessment of the next EU FP
- Ex-post Evaluation of Horizon 2020
Emerging facts and figures: Horizon 2020 is a success

EUR 20.4 billion has been allocated to 11,108 signed grants.

75.9% increase of proposals received annually

FIRST THREE YEARS: An additional EUR 62.4 billion would have been needed to fund all the proposals evaluated as excellent.
Emerging facts and figures

The EU underinvests in R&I activities (gross expenditures on R&D representing 2.03% in 2015 for the EU28.

Horizon 2020's initial objectives are still relevant, but the importance of breakthrough market-creating innovation is now better understood.

Horizon 2020 has been flexible enough to adapt to new emerging needs and subsequent technological and scientific advances, in particular through bottom-up actions.

International obligations such as the implementation of the SDGs have further increased the relevance of Horizon 2020 since investing in R&I has been recognised as essential for achieving this.

The oversubscription demonstrates that Horizon 2020 is relevant for stakeholders.

More than 100,000 proposals have been submitted so far (more than 33,000 per year.)
Overall, Horizon 2020 is on track to deliver on its objectives.

Publications from FP7 and Horizon 2020 projects are cited more than twice the world average.

7% of ERC publications are among the top 1% cited in the world.

365 national research infrastructures have been made accessible to all researchers in Europe and beyond (target: 900 by the end of Horizon 2020).

More than 1 publication out of 5 is based on academic – private cooperation; Horizon 2020 publication have a relatively high share of inter-discipinarity (7.5%) with the EU 13 performing better than the EU 15.
Horizon 2020 projects are supporting interdisciplinary networks.

The main emerging collaborations occur between:
- higher education sector and private firms (2,355 collaborative projects),
- the higher education sector and research organisations (2,289 collaborative projects) and
- the private-for-profit sector and research organisations (2,169 collaborative projects).
Emerging facts and figures

- Overall, the Horizon 2020 contribution to EU13 is much lower compared to EU15 (4.4% and 88.5%) but there are big differences between Member States.

- Per inhabitant, EU15 receive EUR 44 compared to EUR 9 for the EU13. This however does not take into account the differences in the size of the R&I sector in the relevant Member States.

- Per researcher FTE, EU15 receives EUR 11,423 and EU13 receives EUR 3,812. Differences in salaries and reimbursement rates can partly explain this difference.

- Per EUR million invested from the private and public sector in R&I, the EU13 receives EUR 67,524 compared to EU15, which receives EUR 63,277. This is 6.7% higher for EU13.

- There are big differences (18.4 percentage points) between the countries in terms on shares of SME participation - with Hungary, Estonia and Cyprus having the largest share of around 30% of SME participation and Sweden, Romania and Croatia all below 20%.
Estimated internal rate of return is 30%.

Compared to FP7, the externalisation increased cost-efficiency.

Simplification has reduced administrative burden and led to a reduced TTG to 192 days on average.

Current administrative expenditure remains below the target and is particularly low for the executive agencies.
New funding model has mobilised and satisfied stakeholders.

The funding model has not had any major impact on the participation pattern of research organisations and universities.

A specific "Large Research Infrastructure" (LRI) scheme is being used for a selected number of large research organisations with expensive research infrastructure doing research as their core business.

The average real funding level for (non-SME) industry in H2020 is in the area of 58%, i.e. an increase of 4 percentage points compared to FP7 for this population of beneficiaries.

Areas for improvement: the broader acceptance of beneficiaries' usual accounting practice and the unintended effects of the additional remuneration scheme.
• Coherence is supported by the integration of research and innovation into one single programme and the three pillar structure

• There is a need to ensure a balance between different TRL levels

• Complex funding landscape is difficult to understand by stakeholders

• Synergies can be improved
  • Within Horizon 2020
  • With other EU funding programmes
  • With national programmes/activities
Horizon 2020 produces demonstrable benefits in terms of **speed, scale and scope** through the creation of excellence through competition, the creation of international, cross-border, multidisciplinary networks; pooling of resources; creating a leverage effect and creating critical mass to tackle global challenges.

- Beneficiaries have twice as many researchers from other EU countries than similar non-funded teams.

- Horizon 2020 helped to achieve results faster in 45% of projects compared to what could be done at national level.

- Horizon 2020 teams have on average 13.3 collaborations compared to 6 collaborations in the control group.

Strong additionality: 83% of Horizon 2020 funded projects would not have gone ahead without EU funding (100% in RIs, 95% Space and FET)
Emerging conclusions from the stakeholder consultation

Most frequently expressed views

- **Oversubscription** is one of the most commonly quoted issues of Horizon 2020.
- Horizon 2020 is addressing policy priorities of Europe but there is room to increase programme **flexibility**.
- Horizon 2020 needs to ensure a **good balance between research and innovation** (TRLs). There are concerns voiced over perceived increase in funding of higher TRL levels to the detriment of collaborative lower TRL research.
- Horizon 2020 brings an **EU added value**.
- **Widening participation** is crucial, but should not come at expense of excellence.
- The current pillar structure improves the clarity of the programme but the **linkages** among the pillars should be enhanced. The funding landscape is **complex** and there is a need to streamline.
- **Social science and humanities** (SSH) need to be better integrated in the programme design.
Foresight: The BOHEMIA project

A strategic foresight study towards the proposal for the next FP R&I

Part of a strategy for engagement and co-design

“R&I is about creating solutions, opportunities and options across the entire economy”

“Drafting a new FP is not a narrow issue of how to spend money, rather it is a process of agreeing a common vision of the problems we may face, the opportunities we could seize and the tools we will need for either eventuality”
Contrasting scenarios

**Perseverance scenario**

- Climate calamity
- The age of over-exploitation
- Health divide
- Security race
- Losing the race against the machine
- Urban jam

**Change scenario**

- Low carbon transition
- Towards a new well-being
- Towards health for all
- Building societal security
- The innovation revolution for everyone
- Urban bloom

"Europe is at a crossroads: either we keep and strengthen the role as one of the main global actors, or we become an increasingly irrelevant outgrowth on the Asian continent" (Gonzales Report "Europe 2030")
The context of transitions

**SDGs**
- directions for a more inclusive, cohesive, sustainable and resilient EU

**The needs and challenges for governance**
- Sustainability requires governance
- Inequality: a big challenge to the legitimacy of governance

**Getting the regulation right is key (and science can help)**
A strong programme of investment in R&I

Strongly embedded in EU policy

- The values of the EU (art 3 TEU)
- The pursuit of the SDGs

To provide options

- to enable different transition paths
- to empower actors to implement those paths
Basic principles for R&I that emerged from the scenarios

- Let R&I invent opportunities for society before, rather than after a crisis strikes
- Experiment in real world settings
- Learn from the best
- Get the governance right
- Cities as laboratories
- Tear down policy silos
- Be open
Key messages from scenarios report

R&I investment is key for a strong Europe in turbulent times

The systemic nature of the challenges requires
  • Flexibility / experimentation / learn from the best
  • Connecting disciplines / connecting policies / breaking down the silos

Need for options before crises strike
  • Requires direction / and openness – flexibility

Appropriate governance involves
  • Openness, inclusiveness and fairness as principles
  • Cities: a key level of governance / reaching for new actors
  • Public engagement and regulation could make the difference for Europe

The SDGs: a framework for global action
  • global cooperation for global markets to solve global problems
## Concluding remarks: Next steps

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<tr>
<td>Today</td>
<td>Launch of the economic case for R&amp;I</td>
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<td>March (tbc)</td>
<td>Launch of Delphi Survey on foresight statements</td>
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<td>28 April</td>
<td>EESC Stakeholder Conference on the interim evaluation</td>
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<td>End of May</td>
<td><strong>Publication of the Staff Working Document</strong> (evaluation results based on legal base requirements &amp; 5 mandatory evaluation criteria)</td>
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<td>3 July</td>
<td>• <strong>Stakeholder conference on R&amp;I: creating the future we want</strong></td>
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<td>• Presentation of the HLG report on maximising the impact of EU R&amp;I Programmes</td>
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<td>October</td>
<td><strong>Publication of Commission Communication:</strong></td>
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<td>• Overall conclusions on the evaluation results;</td>
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<td>• State of implementation of the FP7 ex-post HLEG recommendations;</td>
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<td>• Response to High Level Group recommendations;</td>
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<td>• Messages on Art. 185 and Art. 187 initiatives.</td>
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<td><strong>Publication of the final foresight report</strong></td>
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Concluding remarks

- R&I are key drivers of productivity and economic growth.
- Investing in R&I at EU level has a clear added value and is expected to generate a wide range of impacts.
- We need to learn from the past to maximize the impact of our future Framework Programme.
- Developing a future Framework Programme requires the development of a common vision of the problems we may face, and of the opportunities to create solutions through research and innovation.
"I am convinced that the core values of Horizon 2020 and its successor have to be:"

EXCELLENCE

OPENNESS

IMPACT
Questions for the future
Thank you for your attention and your enthusiasm!

Nothing great was ever achieved without enthusiasm.

~Ralph Waldo Emerson