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WAYS TO IMPROVE PUBLIC POLICIES.

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MINISTRY OF ECONOMIC DEVELOPMENT

European Union
European Structural and Investment Funds

Process and results of the interim evaluation for Horizon 2020

and

Reflection on the use of the Community Innovation Survey data for evaluation purposes

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12th International Evaluation Conference
Effects of public support schemes on innovation
Wroclaw, 22/06/2017

Content

1- Process and results of the interim evaluation for Horizon 2020 (H2020)

a- Background

b- Main messages per evaluation criteria (Relevance, Effectiveness, Efficiency, Coherence, EU added-value)

c- Conclusions

2- Reflection on the use of the Community Innovation Survey (CIS) data for Evaluation purposes

a- Background

b- Results

c- Caveats

d- Conclusions

1a- Background – Interim Evaluation of H2020

Key features of Horizon 2020

- EU Framework Programme (2014-2020) covering both basic research and close to the market innovation

- Total budget of about EUR 77 billion. Less than 10% of public R&D spending in the EU

- A 3 pillars approach with one general objective "To contribute to building a society and economy based on knowledge and innovation across the Union"

1a- Background – Interim Evaluation of H2020

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EC obligations:

- Horizon 2020 Regulation, art. 32.3: "*By 31 December 2017 (…) the Commission shall carry out, with the assistance of external experts (…), an Interim Evaluation (…)*"

- In addition ➔ Staff Working Document, following *Better Regulation Guidelines (evaluation criteria)*

➔ High expectations: provide inputs for the WP2018-2020 programming and for the next FP design and preparation

1a- Background – Interim Evaluation of H2020

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STRENGTHS

>Wide evidence base

>Use of counterfactual analysis

>Benchmarking with FP7

>Building in-house evaluation culture

CHALLENGES

>Very few projects completed

>Data availability & quality, lack of impact indicators

>Time-lags for R&I impacts

1a- Background – Interim Evaluation of H2020

- **DATA SOURCES**

Surveys, interviews, case studies, expert groups, Horizon 2020 monitoring data (e.g. CORDA), Commission administrative data (e.g. budget), existing databases (e.g. OECD, Eurostat, ORBIS) and publications (incl. European Parliament, European Economic and Social Committee, Court of Auditors)

- **METHODS**

Macro-economic modelling, counterfactual analysis, Social Network Analysis, descriptive statistics, bibliometric analysis, text and data mining analysis, document review, case studies, synthesis of thematic assessments

- **STAKEHOLDER CONSULTATIONS**

Surveys of National Contact Points, Simplification Survey, Call for Ideas on the European Innovation Council, Stakeholder consultation on the Interim Evaluation of Horizon 2020

1b- Main messages per evaluation criteria - Interim Evaluation

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Relevance

- Horizon 2020 logic "*still highly relevant in light of new political priorities*"
  - ➔ Reaction to Ebola and Zika
  - ➔ High attractiveness (30,000 proposals per year vs. 20,000 in FP7)

  - ➔ … "*But rigidity in the bi-annual programming under the Societal Challenges pillar may prevent swift capture of disruptive technologies and business innovations*"

1b- Main messages per evaluation criteria - Interim Evaluation

European Commission

Efficiency

- Externalisation led to efficiency gains ➔ Admin. expenditure <5% budget.
- *"Simplification measures have greatly improved operations, notably on the time-to-grant"*
- Low success rates ➔ "*An additional EUR 62.4 billion would have been needed to fund all the high-quality proposals evaluated."*
- *"Cooperation of EU and third-country organisations has decreased in Horizon 2020 compared to FP7"*

1b- Main messages per evaluation criteria - Interim Evaluation

European Commission

Effectiveness

"(…) progress is being made towards delivering on all Horizon 2020 objectives" ➔ "World class excellence"

- *It attracts EU's and world's best institutions and researchers*
- *About 4,000 peer-reviewed publications cited more than 2x world average*
- *More private sector participations (33.2%) than FP7*
- *Funded projects more likely to be granted patents; patents of higher commercial value than other peers*
- *70% of SMEs aim at new-to-market innovations*
- *"Horizon 2020 is already generating outputs that contribute to tackling societal challenges" (cross-cutting impacts are expected)*

1b- Main messages per evaluation criteria - Interim Evaluation

European Commission

Effectiveness

- ***… But NO "****full effectiveness in terms of market uptake: technological and regulatory obstacles, lack of standards and access to finance, as well as lack of customer acceptance of new solutions.*
- *Also, while supporting established innovators, the programme has not yet been able to reach out to young, fast-growing companies"*

1b- Main messages per evaluation criteria - Interim Evaluation

European Commission

Coherence

- *"Focus areas (…) particularly supported by stakeholders".*
- … BUT too *"large number of instruments"* ➔ *"Difficult to navigate".*
- Too high TRLs ➔ "*Concerns of diverting resources away from preparing future breakthrough innovations"*
- Difficult implementation of synergies with ESIF.

1b- Main messages per evaluation criteria - Interim Evaluation

European Commission

EU Added-Value

COMPARED TO NATIONAL & REGIONAL LEVEL, EU-FUNDED TEAMS:

- *Attract 2x more researchers from other EU countries*
- *Achieve results faster in 45% of projects*
- *Have 2x more collaborations*

83% of projects would not go ahead without EU funding!

1c- Conclusions

- Evaluation of FPs largely relies on traditional indicators (basically, publication and patents) to measure innovation.

- Recommandations in the *Ex Post Evaluation of FP7*: "*Considering that the FPs have consistently been the third largest budget of the European Union, a strategic monitoring and evaluation system is required that increases transparency and serves as a comprehensive and trusted source of evidence-based decision making*" (Martinuzzi et al., 2015)

1c- Conclusions

How to better measure innovation?

- ➔ What about innovation outputs and outcomes? TRLs? Barriers? Environmental impact (CO2/Energy savings)? Further investments? Economic returns?

- ➔ Relevant in the current political framework: Juncker priorities: "Growth, Jobs and Investment".

Full Horizon 2020 Interim Evaluation results:

ec.europa.eu/research/evaluations/index_en.cfm?pg=h2020evaluation

2a- Background – CIS analysis

<u>The Community Innovation Survey (CIS):</u>

- CIS 1 launched in 1992.
- Carried-out and handled by Eurostat
- Biannual.
- Large coverage: 143,669 enterprises from 20 EU's MS and Norway in CIS 2012
- Provides harmonised data on enterprises' innovation activities and results by sector, size of company, type of innovation and the various stages of the innovation process: objectives, sources of information, investments, public funding
- … and includes a question that allows to identify beneficiaries from EU's Framework Programmes!

2a- Background – CIS analysis

European Commission

Aims of the CIS 2008, 2010 and 2012 analysis:

- Assessment of economic impact of FP7:
  - Do firms supported by FP7 perform better?
  - Are there differences by country, size of cie., sector?
  - Do we have Economic returns on innovation?

Causality!!

2b- Results - CIS analysis

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Innovation performance

- FP7-funded innovative enterprises perform significantly better than those not supported.

	Supported by FP7	Non-supported by FP7	Significance Chi-square	Phi coefficient
CIS 2008 (2006-2008)				
New to the market product or service innovations (NEWMKT)	1,132 73.36%	13,376 42,67%	<0.0001	0.13
New to the firm product or service innovations (NEWFRM)	1,082 71.14%	17,554 56.02%	<0.0001	0.064
New to the market process innovations (INPSNM)	357 39.23%	3,471 19.8%	<0.0001	0.106
CIS 2010 (2008-2010)				
New to the market product or service innovations (NEWMKT)	1.076 79.79%	11,575 31.59%	<0.0001	0.186
New to the firm product or service innovations (NEWFRM)	917 70.38%	15,299 41.72%	<0.0001	0.106
New to the market process innovations (INPSNM)	362 49.05%	3,048 12.83%	<0.0001	0.203
CIS 2012 (2010-2012)				
New to the market product or service innovations (NEWMKT)	1.191 78.51%	10,144 43.38%	<0.0001	0.169
New to the firm product or service innovations (NEWFRM)	943 66.74%	13,821 59.38%	<0.0001	0.035
New to the market process innovations (INPSNM)	378 42.81%	2,732 18.83%	<0.0001	0.156

2b- Results - CIS analysis

- Relatively small, but significant, differences per size:

Large companies use to perform better than SMEs.

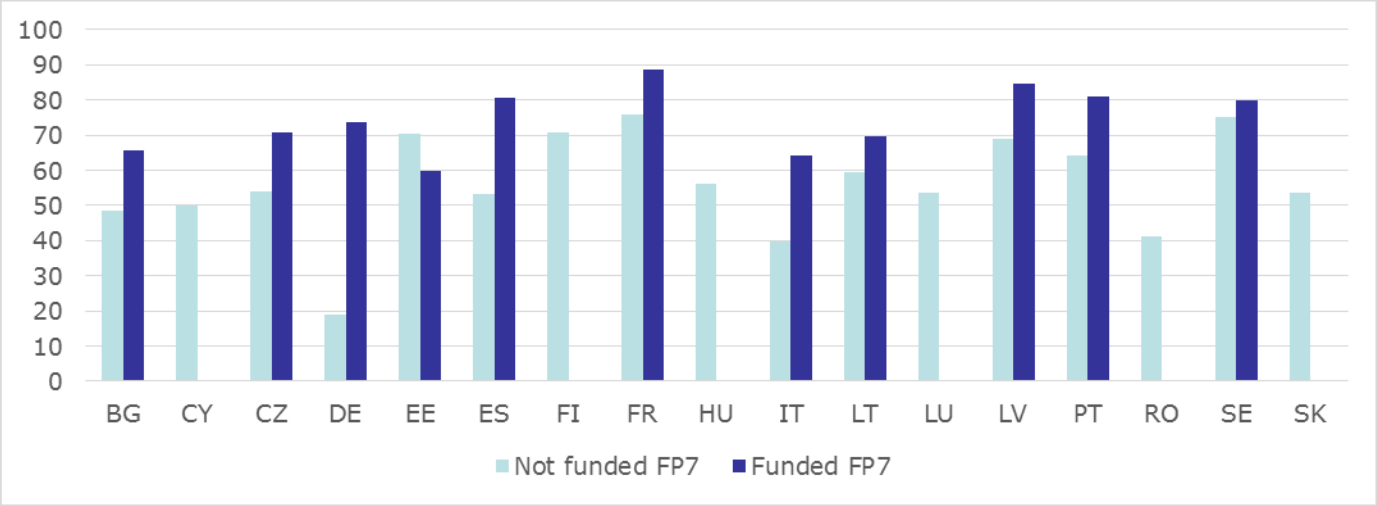
		Large	Micro	Small	Medium
CIS 2008	Not funded FP7	51.6%	40.1%	39.1%	43%
(NEWMKT)	Funded FP7	79.1%	69.9%	70.4%	69.7%
CIS 2010	Not funded FP7	46.4%	30.6%	24.9%	35.5%
(NEWMKT)	Funded FP7	81.4%	81.6%	76.1%	76.7%
CIS 2012	Not funded FP7	51.6%	43.4%	39.5%	43.2%
(NEWMKT)	Funded FP7	82.4%	79.6%	76.8%	73.5%

NEWMKT: "New or significantly improved good or service introduced onto your market before competitors"

2b- Results - CIS analysis

- Country is a much more significant variable.

CIS 2012



N= 11,492 innovative enterprises not funded by FP7 (31.5% of the total) and 996 enterprises funded by FP7 (77.6% of the total)

- NB: Contingency coefficient: 42,3%
- Differences much less pronounced between countries when enterprises funded by FP7 ➔ "Cohesion role" of FP7

2b- Results - CIS analysis

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- Sector is also a statistically significant variable:
  - **Manufacturing** (NACE C) **provides the majority of new to market innovations**, in the whole economy and amongst FP7 funded enterprises (>50% in all cases and years)…
  - **…Followed by Information and Communication** (NACE J, around 10-14%), by **"Wholesale, retail and repair of vehicles"** (G, <10%) and **"Professional, scientific, technical activities"** (M, <10%).
  - **Within innovative enterprises supported by FP7, Manufacturing** (>50%)**, Scientific & Technical services** (around 25%) **and ICT** (12-14%) **cover alone 90% of the new products to the market.**
  - **Big gap in innovation performance between FP7-funded firms and not funded ones. Examples**:
    - In CIS 2008, 73,2% of FP7-funded manufacturing enterprises introduced innovations new to market. 79,4% in CIS 2012 compared to 47% for non funded companies.
    - Sectoral differences sometimes higher than +100% and +200%!
    - ICT, most performant sector (FP7 funded and overall).

2b- Results - CIS analysis

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CIS 2008: Eco-innovation module

- Allows to quantify innovations with environmental benefits (materials or energy savings, reduced CO2 footprints, waste or water efficiency, etc.)
- Innovative companies supported by FP exploit proportionally much more environmental-friendly products and services:

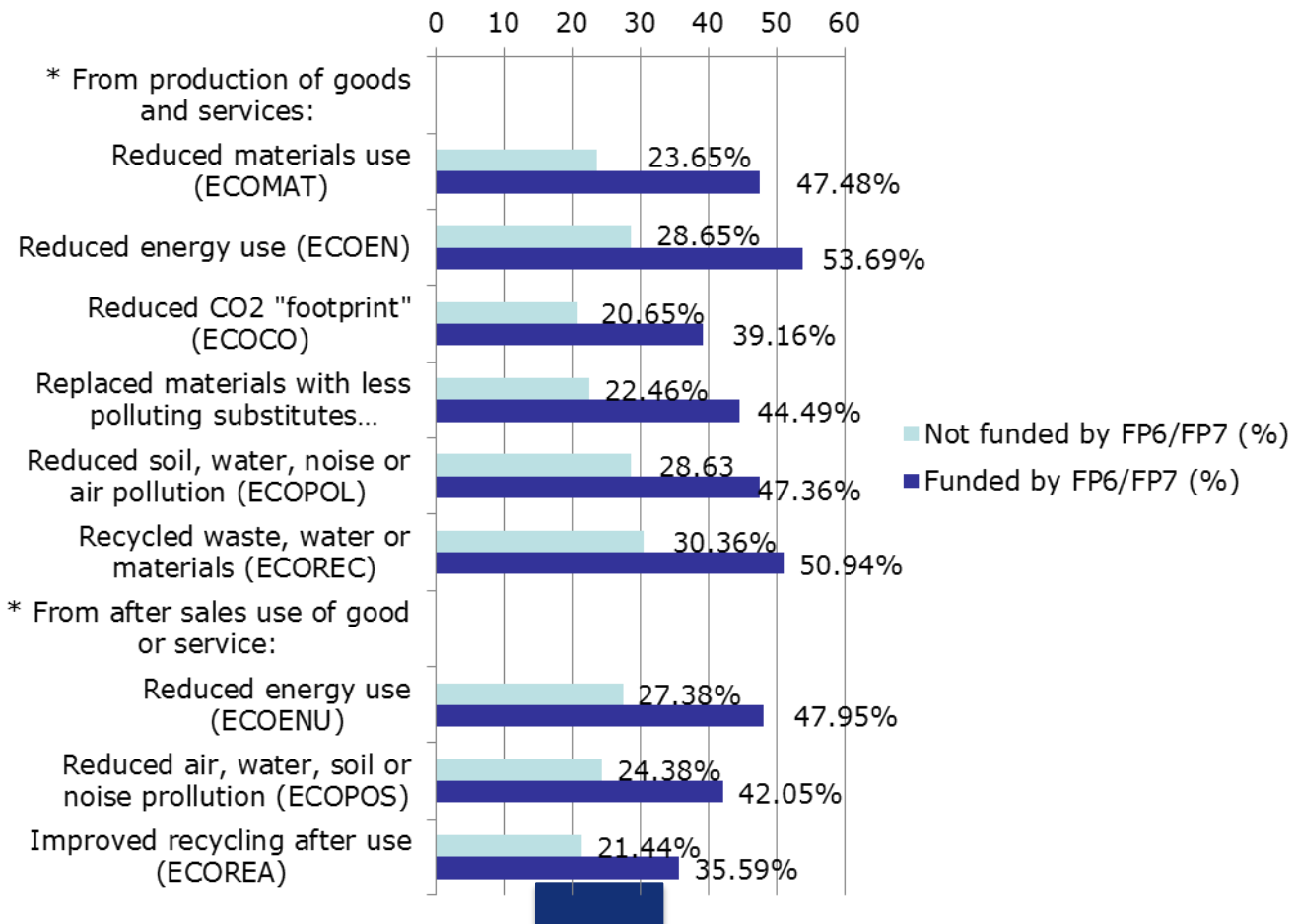
Percentage of innovations with at least one environmental benefit

	No environmental benefit	Environmental benefit	N
Not funded by FP6/FP7 (% by row)	80.12%	19.88%	65,180
Funded by FP6/FP7 (% by row)	43.63%	56.37%	1,783
Total (% by row)	79.15%	20.85%	66,963

2- Results - CIS analysis

CIS 2008: Eco-innovation module

- With more detail, by type of eco-innovation:



2- Results - CIS analysis

CIS 2008: Eco-innovation module

- Eco-innovation drivers:
  - **Existing regulations and taxes** (24.7%/44.7% for FP7 non-funded and funded firms respectively)
  - **Voluntary codes or agreements, future regulations or market demand similar response rates** (17-19%/38-39%).
  - **Surprisingly, grants, subsidies or other financial incentives are the less often quoted factor, including among FP6/FP7-funded companies** (10.4%/22.7%).

➔ **Very useful for policy** (e.g. EC's Fitness Checks…)

➔ **Next module in CIS 2014 (forthcoming).**

2- Results - CIS analysis

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Economic impact

- CIS provides data on % of turnover derived from innovations + on total turnover enterprises.

➔ Possible to assess differences between FP7-funded enterprises and those not funded and economic impact (in terms of sales).

2- Results - CIS analysis

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Economic impact

- Percentages of turnover coming from innovations

CIS 2008	New to the market innovation (% turnover)	T-test significance (method)	New to the firm innovation (% turnover)	T-test significance (method)
Not funded FP7	5.2	<0.0001 (Satterthwaite)	8.1	0.0004 (Satterthwaite)
Funded FP7	17.4		15.4	
CIS 2010	**New to the market innovation (% turnover)**	**T-test significance (method)**	**New to the firm innovation (% turnover)**	**T-test significance (method)**
Not funded FP7	8.5	<0.0001 (Satterthwaite)	12.2	<0.0001 (Satterthwaite)
Funded FP7	18.7		15.4	
CIS 2012	**New to the market innovation (% turnover)**	**T-test significance (method)**	**New to the firm innovation (% turnover)**	**T-test significance (method)**
Not funded FP7	10.8	<0.0001 (Satterthwaite)	15.7	0.69 (Satterthwaite)
Funded FP7	19.1		15.4	

2c- Caveats – CIS analysis

- **Timing vs. FP7's and Horizon 2020's**
- **Geographical coverage**
- **Questionnaire design:** Due to filters, question allowing identification of FP7-funded firms covers only (i) innovative enterprises, and (ii) product, service and process innovation (no marketing and organisational)
- **Confidentiality rules:** Relevant amount of information lost when more than 2 variables are crossed (esp. if one is FP7 funding) ➔ Much more relevant than expected…
- **Eco-innovation module**: Too focused on regulation, compared with economic and ethical motivations. Only on eco-innovation motivations - what about factors/behaviours (e.g. regulation) non-innovative firms? (Mazzanti, 2016)
- Of course, **causality issue always to keep in mind!**

4- Conclusions – CIS analysis

- In any case, this analysis demonstrates that **CIS is relevant for evaluating and monitoring the Framework Programmes - and Horizon 2020.**
- Provides **quantitification** in terms of **exploitation of innovation results**
- Even if the data are incomplete or not detailed enough (e.g., to analyse the specific impacts by FP7-Cooperation Theme or Horizon 2020-Societal Challenge), **the main information is provided…**
- **… with relatively basic statistical skills!**

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Thank you!