



➤ Counting what really counts?  
Key issues for the measure of research  
impact (and ways to address them)

Pierre-Benoit JOLY, INRAE Toulouse and LISIS

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## ➤ Introduction : Key issues for the measure of research impacts

**Measure of scientific impact** of research does not raise major problems, in general. For example: number of citations received as a proxy of scientific impact.

The **measure of societal impact** is much more difficult. We generally have to deal with three main difficulties:

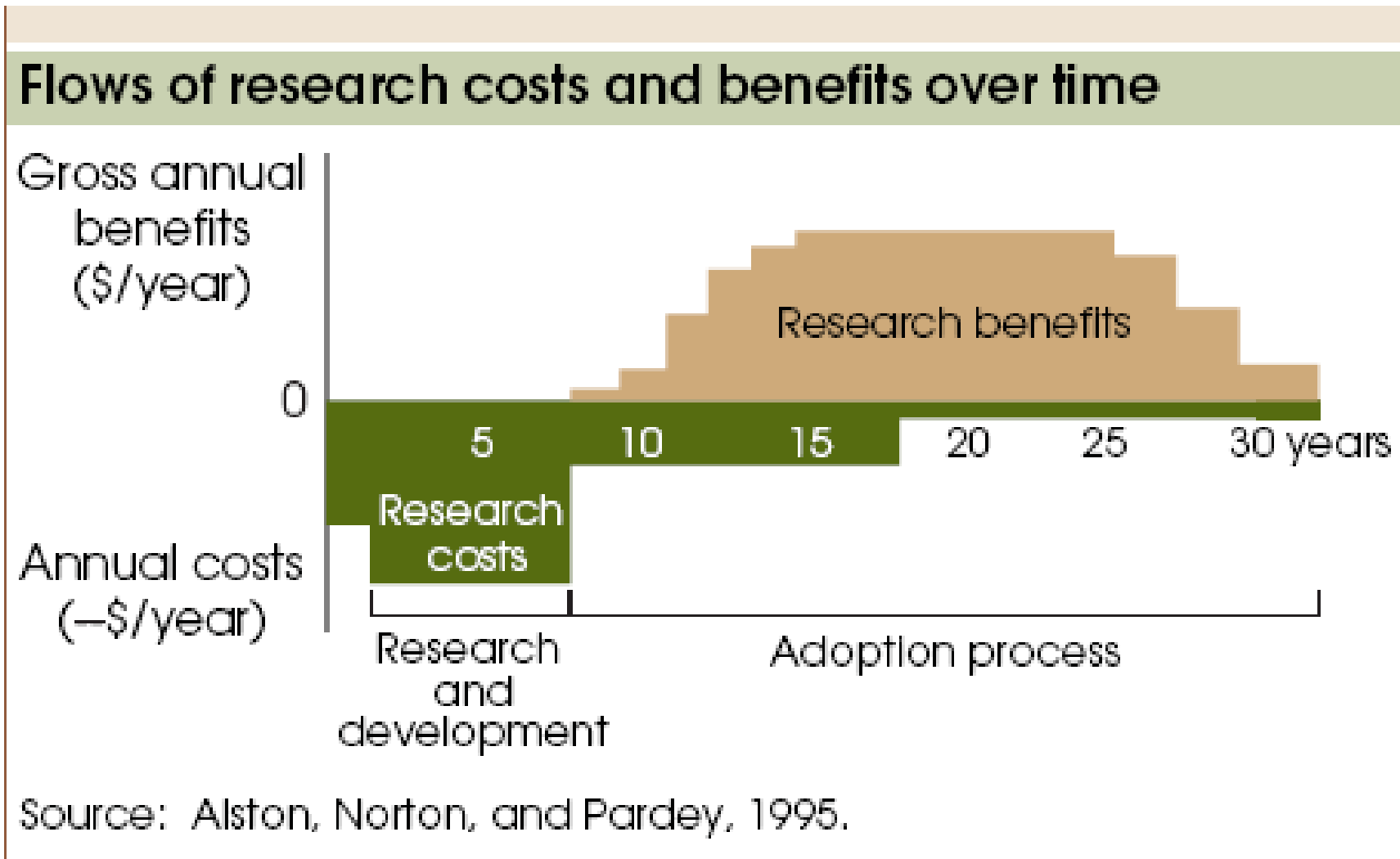
- The problem of attribution
- The time lag
- The measure of non economic impact

# Outline

- Econometric approaches and CBA
- Othe approaches
- The ASIRPA approach to measurement of research impact



## ➤ Econometric approaches and CBA (1)



## ➤ Econometric approaches and CBA (2)

**Table 1 –Summary estimates of the rate of return to U.S. agricultural research**

Item	Studies, 1965-2005	Mean estimate	Median estimate
Social rate of returns to public agricultural research	35	53	45
Social rate of returns to private agricultural research	4	45	45

Source: USDA, ERS, using data from Huffman and Evenson, 2006, and Fuglle et al., 1996.

## ➤ Econometric approaches and CBA (3)

- Benefit: possible to implement at various levels of aggregation if data are available
- Limitations:
  - *The problem of attribution*: implementation of econometric approaches has generally overestimated rates of returns (externalities, hidden factors, etc.)
  - *The time lag*: data on input (R&D investment) and output (TFP, etc.) may not be available on dozens of years
  - *The measure of non economic impact*: series on non economic impacts generally non available

## ➤ Other approaches

Simt & Hessels, 2001, *Res. Ev.*

**Table 1.** Overview of the assessment methods reviewed in this article

Method	Evaluation type	Level of analysis	Qualitative data	Quantitative data	Original context	Key publication
Payback Framework	Ex post; summative	Programme	Documents, interviews, surveys	–	UK medical research	<a href="#">Buxton and Steve (1996)</a>
Science and Technology Human Capital	Ex post; formative	Research group or programme	Interviews, surveys, diaries, resumes, contracts	Citation and patent patterns	US STEM research	<a href="#">Bozeman, Dietz, and Gaughan (2001)</a>
Public Value Mapping	Ex ante and ex post; formative	Programme or organization	Case studies, documents, surveys, focus groups, expert opinions	Indicators	US science policy	<a href="#">Bozeman (2003)</a>
Monetisation	Ex post; summative	Programme or system	–	Measures of investment and (health) gains	UK medical research	<a href="#">Health Economics Research Group (HERG), Office of Health Economics, RAND Europe (2008)</a>
Flows of Knowledge	Ex post; summative	Programme	Case studies, documents, interviews, surveys, focus groups	Bibliometrics	UK research council funding	<a href="#">Meagher, Lyall, and Nutley (2008)</a>
SIAMPI	Ex ante and ex post; formative	Project, programme, or organization	Case studies	Contextual response analysis and indicators of (im)material interactions	Research institutes (ICT, health, SSH, nano) for European Commission	<a href="#">Spaapen and van Drooge (2011)</a>
Contribution Mapping	Ex post; summative and formative	Project or programme	Interviews with all actors	–	Global health sector	<a href="#">Kok and Schuit (2012)</a>
Impact Narratives (REF)	Ex post; summative	Research group	Structured case studies, (user) expert opinions	Indicators for causal impact	UK assessment of university research (REF)	<a href="#">REF (2012)</a>
ASIRPA	Ex post; summative	Programme or organization	Standardized case studies	Econometric, bibliometric and statistical methods	French public agricultural research institute	<a href="#">Joly et al. (2015)</a>
Evaluative Inquiry	Ex post; formative	Research group or organization	Documents, interviews, workshop	Contextual scientometrics, contextual response analysis	Dutch assessment of university research (SEP)	<a href="#">de Rijcke et al. (2019)</a>

## ➤ The ASIRPA approach to measurement of research impact

A **case study** approach (like many other research impact approaches, including SIAMPI, UK REF, Dutch Univ. Assessment, etc.)

A processual/contextual analysis

**Ex post** assessment

How do we deal with the main difficulties identified?

- The problem of attribution:

**Impact pathway** analysis which allows to identify the **specific contribution** of research to societal transformations

- The time lag

Selection of « **old** » **cases** / Observation of **outcomes – potential impacts** / Possible to develop a real-time approach

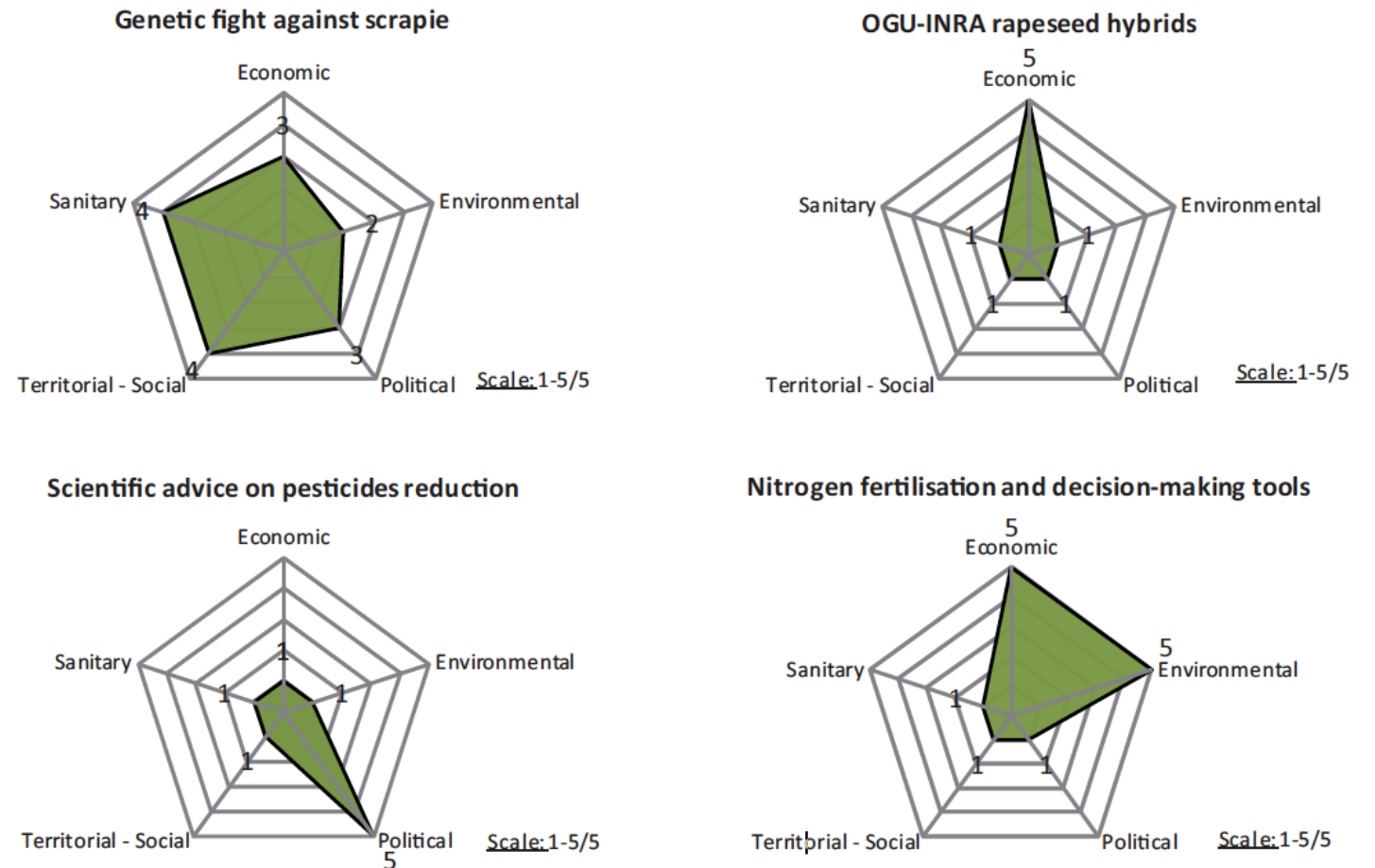
- **The measure of non economic impact**





ASIRPA considers five categories of impact:

- economic
- political
- environmental
- Social
- Health



**Figure 3.** Example of impact radars from ASIRPA case studies.

## ➤ How do we **measure** impact?

For each dimension of impact we designed **rating scales**.

Rating scales have the following properties:

- To match impact scores to generic criteria which are relevant to the diversity of impacts reported in a range of cases;
- To build a sufficiently explicit scale to achieve objectified self-assessment by the researchers involved in the cases on the basis of information collected from interviews with stakeholders;
- To build a scale which does not require further involvement of expert panels in order to assess individual cases.

## ➤ Exemple of impact on public policy

Dimensions of political impact	Subdimensions
Use in public debate and policy negotiation	<ul style="list-style-type: none"><li>• Quality and strength of research messages conveyed</li><li>• Timeliness of debate and political agenda-setting</li><li>• Intensity and quality of media coverage</li><li>• Intensity and quality of debate</li></ul>
Use for policy-making	<ul style="list-style-type: none"><li>• Stages of the policy cycle affected: agenda-setting, and formulation, implementation, and evaluation of policies</li><li>• Territorial scale of policies</li><li>• Relevance and novelty of the solution provided for policy</li></ul>
Long-term percolation of ideas	<ul style="list-style-type: none"><li>• Importance of knowledge in the debates</li><li>• Circulation of ideas in later studies/debates and broader spheres</li><li>• Long-term relevance of ideas and non-distortion of messages</li></ul>
Societal importance of the policy domain at stakes	<ul style="list-style-type: none"><li>• Potential gravity and systemic aspects of stake</li><li>• Magnitude of the policy and affected population</li><li>• Societal concern</li></ul>

Experts (A, B, C, D) are asked to give a mark to the cases

And explain why they give this mark

(example of the case of BPA)

**Table 2** Examples of the arguments proposed by the experts on three cases (out of the five pilot cases) for the dimension “use in public debate and policy negotiation”

Experts	Mark (/5)	Arguments related to each sub-dimension of “use in public debate and policy negotiation”			
		Quality and strength of research messages conveyed	Timeliness of debate, political agenda-setting	Intensity and quality of media coverage	Intensity and quality of debate
<i>Case alert on the dangers of Bisphenol A (BPA)</i>					
A	4	Research raised new questions for the agenda		Very intense mainstream media coverage	
B	3	Some weaknesses in the message affect credibility (data and research design)			
C	3	INRA is not the main scientific referee, affects strength of messages			
D	5		Direct effect on a political window of opportunity	Intense media coverage to a large audience (policy, politic, citizens, private sector). Little distortion of messages	Large contribution of research to the debate beyond sectoral policy, at the national level (parliament)



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Objectif Territoriales

... These explanations are used to construct the rating scale  
(Example of the dimension « public debate and policy negotiation »)

**Table 3** Dimension Use in public debate and policy negotiation

	5	4	3	2	1	Total
Quality and strength of research messages conveyed	Original messages, easily traceable in the public debate Strong credibility related to PRO reputation	Messages easily traceable in the public debate Original messages but arising from the state of the art rather than new research results OR Original knowledge but moderate credibility	Messages easily traceable in the public debate But weaknesses for some reasons: technical, legitimacy, ambiguity	Messages poorly traceable in the public debate	Messages are not new	/5
Timeliness of debate and political agenda-setting	Agenda-setting of new questions	Knowledge produced during a political or societal window of opportunity	Knowledge produced during a sectoral window of opportunity	Knowledge mediated during a sectoral or societal window of opportunity	Knowledge produced and mediated out of any agenda	/5
Intensity and quality of media coverage	Large media coverage to inform the general public and the stakeholders involved. Messages properly conveyed.	Large media coverage to the general public and the stakeholders involved. Messages properly conveyed, although with some slight cherry-picking	Media coverage to sectoral stakeholders only Messages properly conveyed	Incomplete media coverage to sectoral stakeholders	No or very small media coverage	/5
Intensity and quality of debate	Large public debate The debate involves the whole spatially relevant political sphere	Large public debate The debate partially involves the spatially relevant political sphere	Broad sectoral debate at relevant spatial level, but no public debate	Scattered debates with no territorial or sectoral relevance	Restricted debate, no public debate	/5
						Total average/ 5

The rating scales were tested successfully on c. 50 case studies.  
They will benefit of on-going improvements through learning by using.

We observe that rating scales help researchers to better understand the different dimensions of impact.

They provide a generic metric which is robust, but which provides data that cannot be easily aggregated.

## ➤ Conclusion

- ASIRPA is one example of approaches that explore new ways for measuring impact
- This approach is now implemented on a routine basis at INRAE. Still being improved!
- The approach mainly aims at understanding impact and fostering learning processes for improving the capacity of research to contribute to impact
- The case study approach allows to produce narratives based on qualitative and quantitative
- Type approach is relevant at the level of projects, programmes and organisations. Less adapted at the macro-level!
- Current development of a real-time approach



# Thanks for you attention!

## And thanks to the ASIRPA Team!

### Main references

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