

SOCIO-ECONOMIC IMPACT STUDIES FOR PUBLIC INVESTMENT: SCIENCE IN THE CONTEXT OF EUROPEAN FUNDING MECHANISMS

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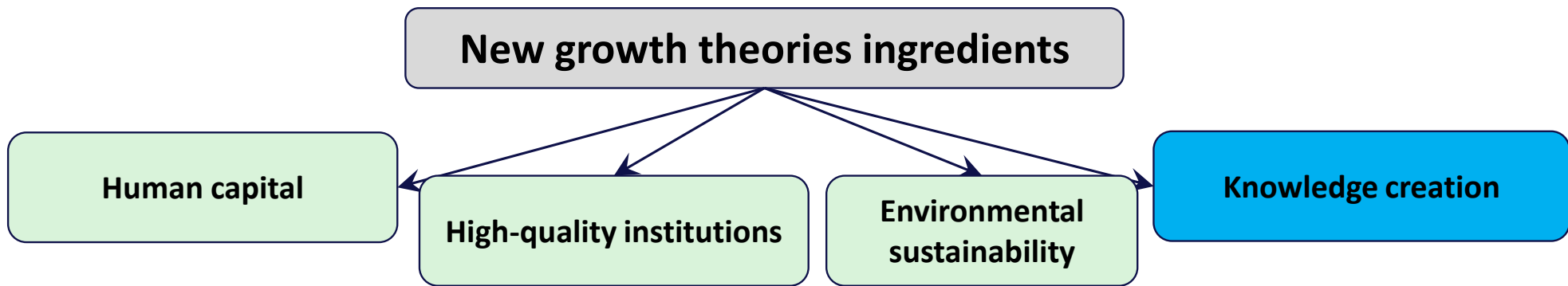
with

Gelsomina Catalano (Centre for Industrial Studies)

FCCIS WP4



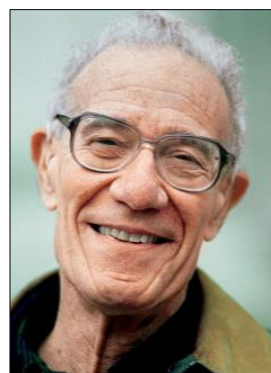
WHY GOVERNMENTS NEED TO ASSESS THE SOCIO-ECONOMIC IMPACT OF ANY PUBLIC INVESTMENT?



- GDP = consumption + **investment**
 (private and public) (private and **public**)
- GDP growth is a function of capital **investment**, human capital, **knowledge**, and other inputs
- **Knowledge** is a function of **R&D expenditure**
 (private and **public**)



K. Arrow
Nobel prize 1972



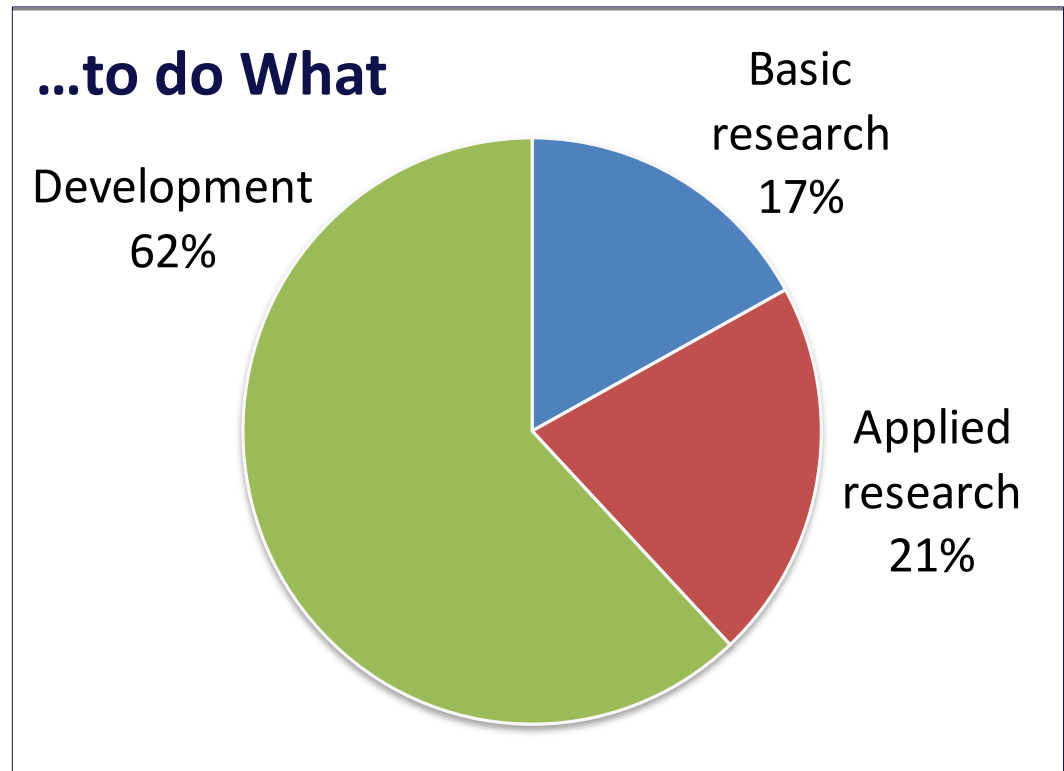
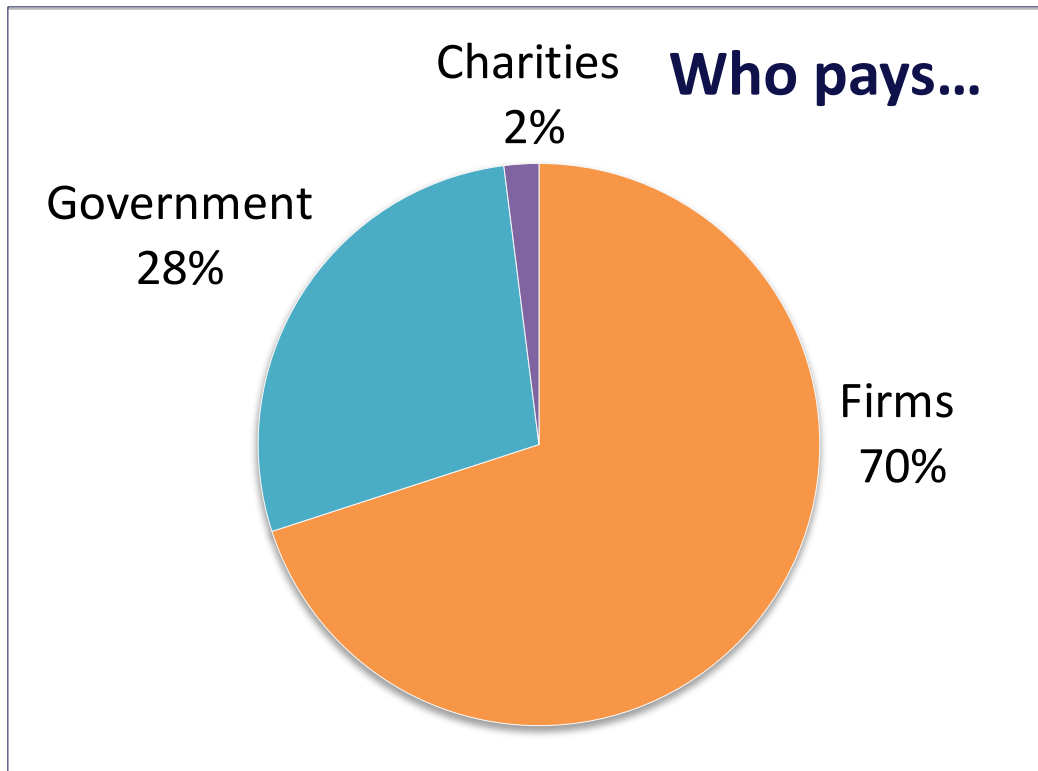
R. Solow
Nobel prize 1987



P. Romer
Nobel prize 2018

R&D EXPENDITURE

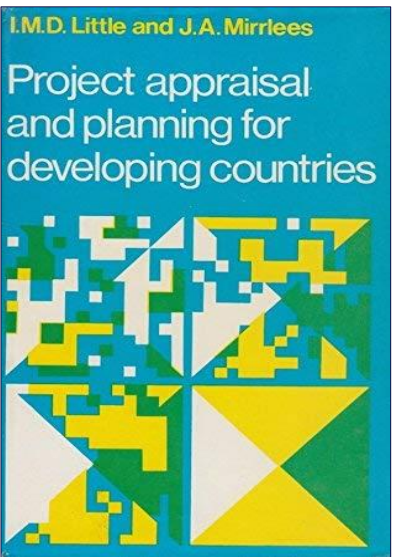
- \$250 per capita taxes (OECD)
- The EU spent €311 billion on R&D in 2020
- 2.3% of GDP in 2020 (China: 2.1%, US: 3.1%, Japan: 3.2%) Source: Eurostat, March 2022



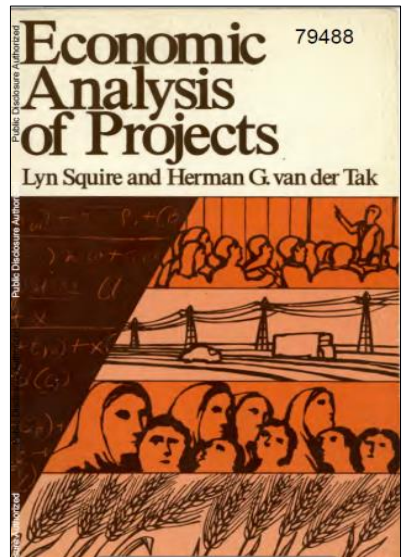
- **Source:** OECD data 2015-2017

Which projects should take priority, given their costs and unknown benefits?

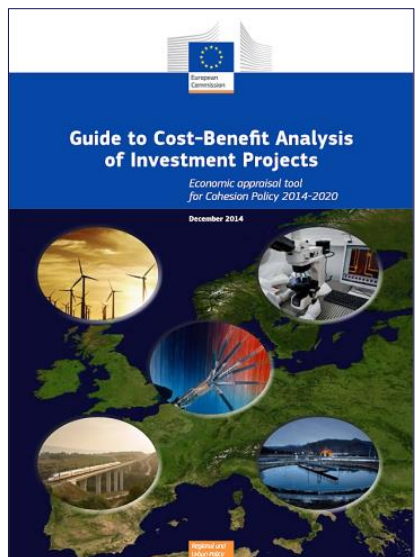
Intellectual attempts to introduce economic rationality in public investment



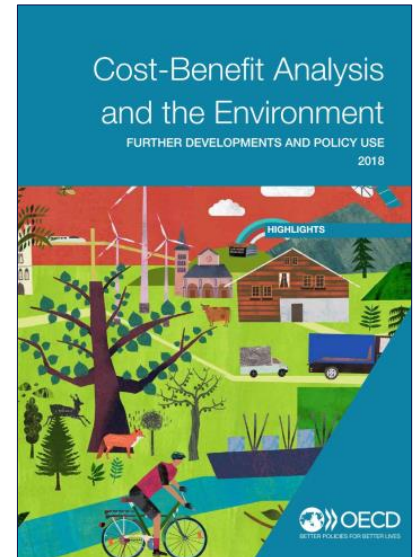
1972



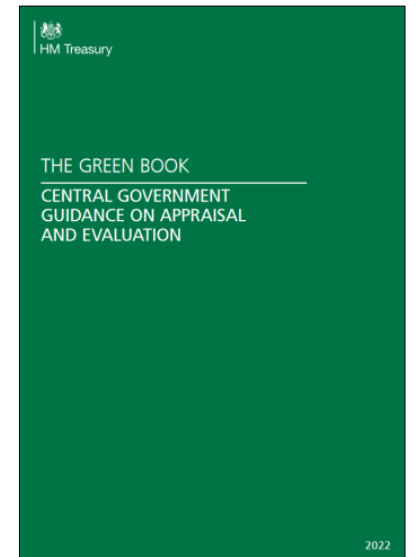
1975



2014



2018



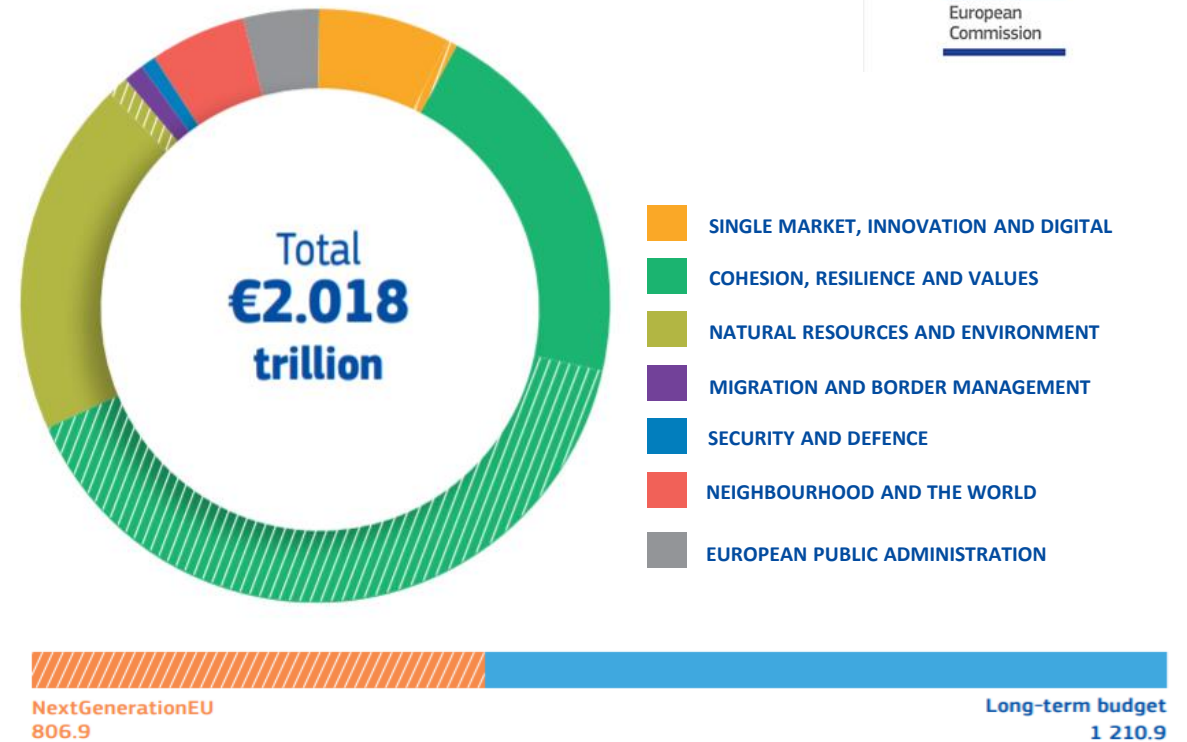
2022



RESOURCES AVAILABLE FROM EUROPEAN UNION



- **research and innovation**, via Horizon Europe and other mechanisms
- **climate and digital transitions**, via the Just Transition Fund and the digital Europe programme
- **preparedness, recovery and resilience**, including health programme



EU FUNDS 2021-2027

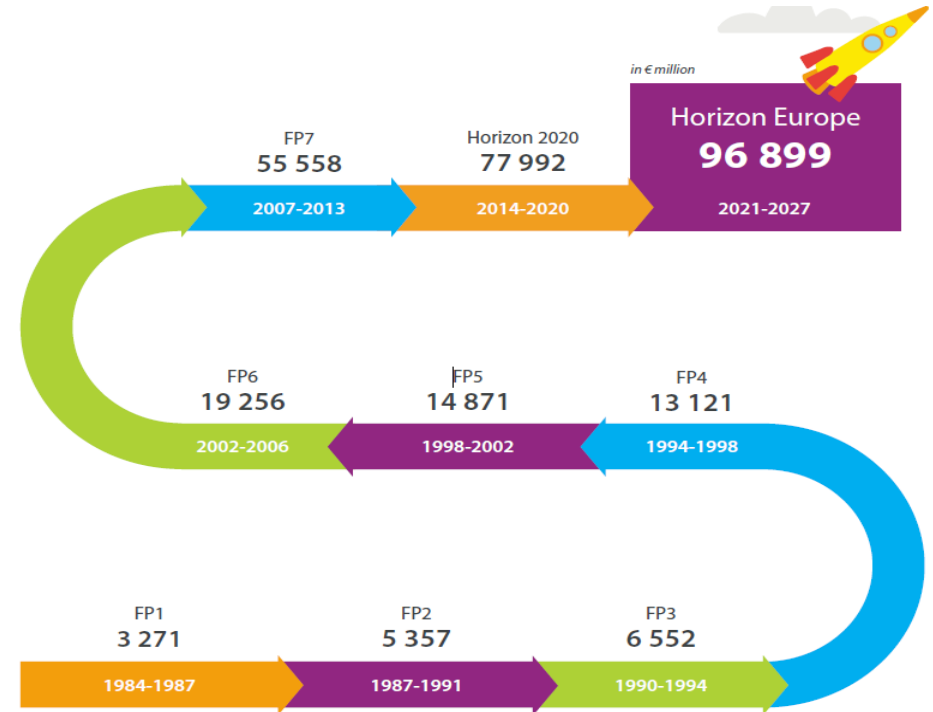
HORIZON EUROPE BUDGET

Horizon Europe programme structure



	Total <i>in € million</i>
EXCELLENT SCIENCE <i>of which</i>	25 011
The European Research Council (ERC)	16 004
Marie Skłodowska-Curie Actions (MSCA)	6 602
Research infrastructures	2 406
GLOBAL CHALLENGES AND EUROPEAN INDUSTRIAL COMPETITIVENESS <i>of which</i>	53 516
Health	8 246
Culture, creativity and inclusive society	2 280
Civil Security for Society	1 596
Digital, Industry and Space	15 349
Climate, Energy and Mobility	15 123
Food, Bioeconomy, Natural Resources, Agriculture and Environment	8 952
Non-nuclear direct actions of the Joint Research Centre (JRC)	1 970
INNOVATIVE EUROPE <i>of which</i>	13 597
European Innovation Council (EIC)	10 105
European innovation ecosystems	527
European Institute of Innovation and Technology (EIT)	2 965
WIDENING PARTICIPATION & STRENGTHENING THE EUROPEAN RESEARCH AREA <i>of which</i>	3 393
Widening participation and spreading excellence	2 955
Reforming and enhancing the European R&I System	438

TOTAL HORIZON EUROPE **95 517**



EURATOM 2021-2025 BUDGET

Euratom programme structure

	Total <i>in € million</i>
INDIRECT ACTIONS	850
Fusion research and development	583
Nuclear fission, safety and radiation protection	266
DIRECT ACTIONS	532
Direct actions undertaken by the Joint Research Centre	532

TOTAL 2021-2025 EURATOM **1 382**

Source: European Commission, Directorate-General for Research and Innovation, *Horizon Europe, budget : Horizon Europe - the most ambitious EU research & innovation programme ever*, Publications Office, 2021

USE OF PROJECT EVALUATION IN EU COHESION POLICY

MAJOR PROJECTS

- More than 2500 projects:
- 1121 CF and 258 ERDF (2000-2006)
- 970 (2007-2013)
- 360 (2014-2020) and more

RTD PROJECTS

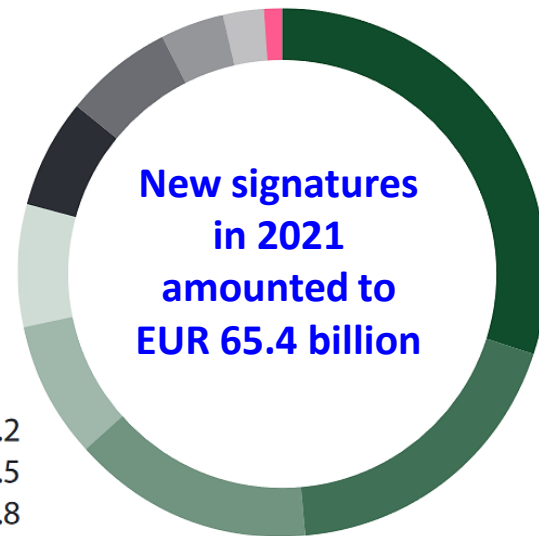
- Moreover 20,000 RTD projects
- In 53 ERDF Operational Programmes
- Invested EUR 14.64 billion



RESOURCES AVAILABLE FROM EUROPEAN INVESTMENT BANK



DISTRIBUTION BY SECTOR OF THE STOCK OF LOANS AT END-2021 (%)



Transport	30.2
Global loans	18.5
Energy	14.8
Health, education	8.4
Miscellaneous infrastructure	7.5
Water, sewerage	6.6
Industry	6.5
Services	3.9
Telecommunication	2.6
Agriculture, fisheries, forestry	1.0

- Launched in 2014, “InnovFin” offers EUR 24bn of financing to foster EUR 50bn of **RDI investments**
- InnovFin Large Projects: loans from EUR 25m to EUR 300m for **RDI projects** (large firms, universities and public research organisations, research infrastructures, PPPs and special-purpose vehicles)

InvestEU indicative proposed budget allocation 2021-2027

Windows	Budgetary guarantee	Mobilised investment (estimate)
Research, Innovations, Digitalisation	11 250	200 000

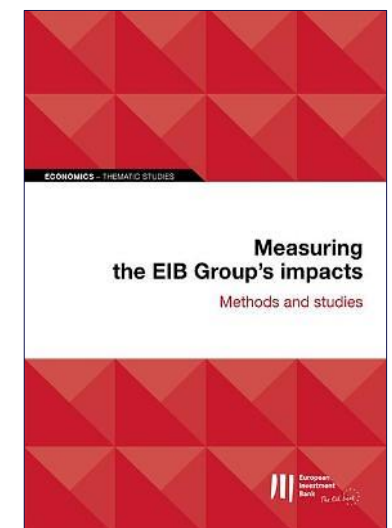
EUR million

Source: <https://www.fi-compass.eu/content/presentation-invest-eu-2021-2027-eu-budget-future>;
https://www.eib.org/attachments/publications/eib_financial_report_2021_en.pdf

THE ROLE OF SOCIO-ECONOMIC IMPACT ASSESSMENT IN THE MANAGEMENT OF EIB RESOURCES

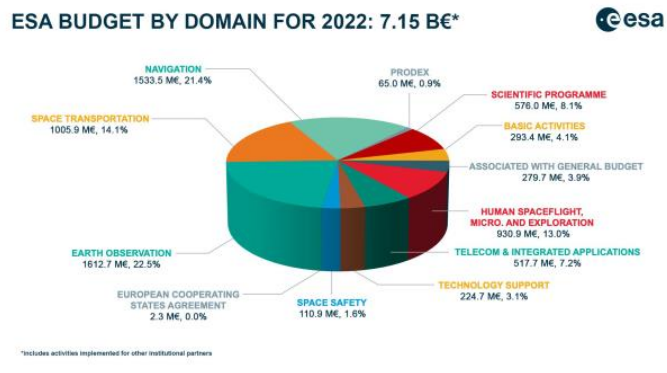
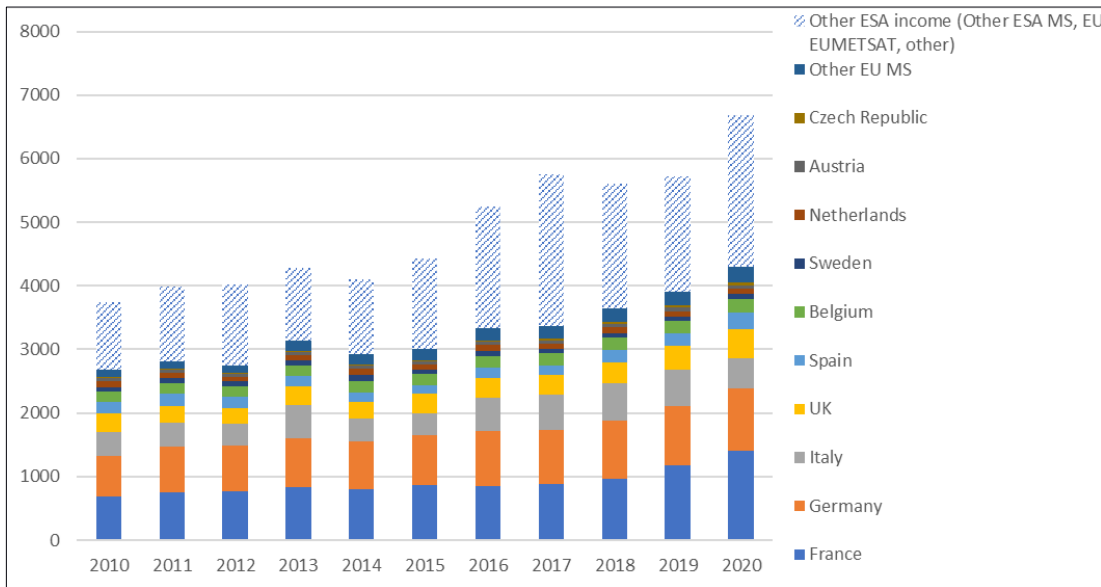


- The EIB conducts **economic appraisals** of projects considered for financing
- **CBA** as the default methodology to estimate a project's economic rate of return that accounts for broader project benefits and costs to society, including environmental externalities
- It also applies **cost effectiveness analysis** and, more recently, **multi-criteria analysis**, taking into account the evolving circumstances of each sector
- The results enter into the overall evaluation framework of projects applying for a loan from the EIB (**additionality and impact measurement framework**)



RESOURCES AVAILABLE FOR EUROPEAN SPACE AGENCY

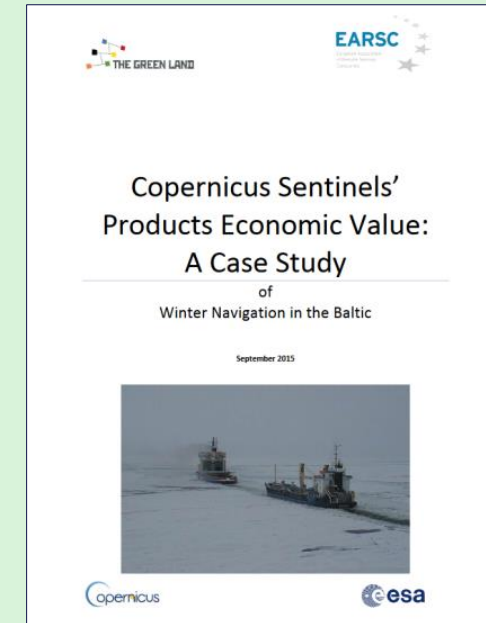
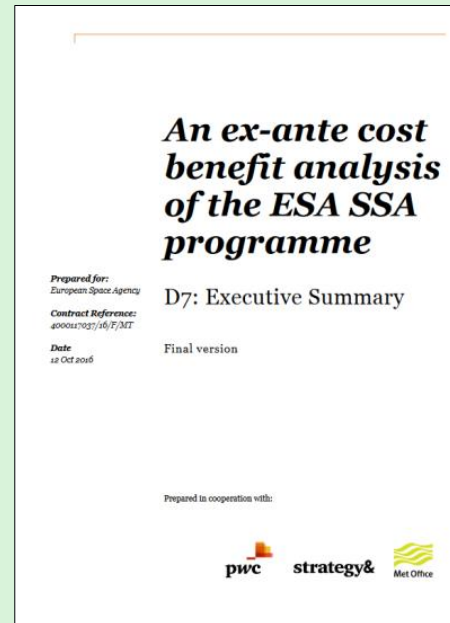
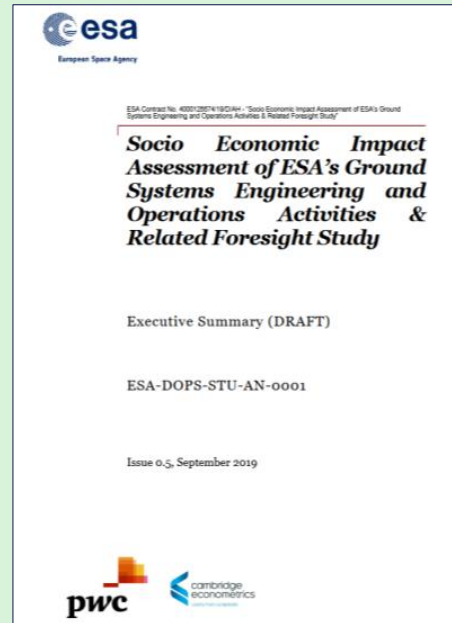
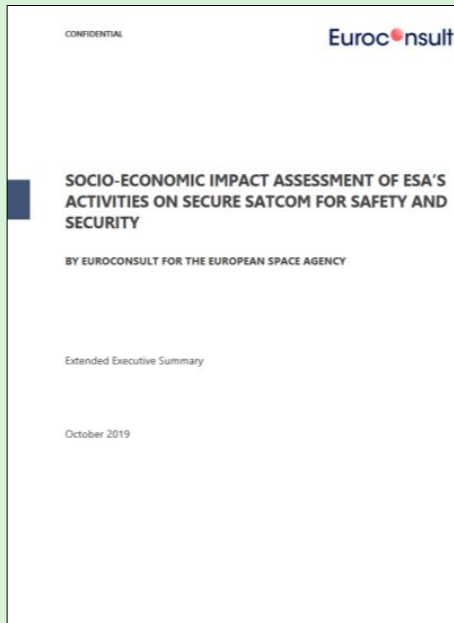
IN THE LAST 10 YEARS, ESA BUDGET INCREASED BY 78.3%



Source: ESA publicly available data, CSIL Analysis

- Committed to provide evidence and transparency about its effectiveness to secure returns on Member States' investments, ESA has been studying the **socio-economic benefits** of its activities and programmes since the 1990s
- Methodology consolidated since 2012, in line with recognised standards (e.g., Cost Benefit Analysis, Input-Output modelling, Multi Criteria Analysis)
- Harmonised approach, tailored to the specificities of programmes
- Independent results for each study

THE USE OF SOCIO-ECONOMIC IMPACT ASSESSMENT BY ESA



UK RESEARCH AND INNOVATION (UKRI)



- Research grant panels judge the proposal against the following key assessment criteria
 - Scientific and technical excellence
 - International competitiveness
 - Strategic value within the STFC programme
 - Leadership, planning and project management
 - **Social and economic impact from the proposed research**
 - Sustainability (of key instrument or construction groups)
 - Associated studentships



The Square Kilometre Array Observatory



Diamond II

More information are available at

<https://www.ukri.org/councils/stfc/guidance-for-applicants/what-happens-after-you-submit-your-proposal/review-and-assessment-of-proposals/assessment-criteria/>; <https://www.ukri.org/what-we-offer/creating-world-class-research-and-innovation-infrastructure/funded-infrastructure-projects/>; <https://www.technopolis-group.com/wp-content/uploads/2021/06/Socio-Economic-Study-Report-Diamond.pdf>; <https://www.ukri.org/wp-content/uploads/2022/02/STFC-240222-SocioEconomicImpactEvaluationStudyUKSubscriptionESO-FinalReportSummary.pdf>

ITALY

- The **National Plan for Research Infrastructure** identifies priority Research Infrastructures in Italy by relying on European methods and criteria
- **bottom-up** and **top-down** elements

IT RELIES ON FIVE STEPS

1. Definition of criteria

2. National consultation of RIs

3. Consultation at regional level

4. Analysis of suggested RIs

5. Identification of priority RIs

PNIR 2021-2027	
1.	Scientific excellence
2.	Socio-economic impact
3.	Critical analysis of history and perspectives (e.g., previous national and regional support and legal status)
4.	Completeness of access policies
5.	International relations and pan-European relevance (e.g., inclusion in the ESFRI roadmap or EIRC status)
6.	Political commitment and financial support from participating countries
7.	Governance and human-resources management
8.	Financial aspects (sustainability)



ELETTRA synchrotron, Trieste



EuPRAXIA, Frascati (RM)

EUROPEAN STRATEGY FORUM ON RESEARCH INFRASTRUCTURES

ESFRI engages in well-defined roadmapping processes with publicly available rules and procedures. **Socio-economic impact** has become one of important considerations in the road-mapping process that identifies European investment priorities in Research Infrastructures, as it has been formally considered as one of the **evaluation criteria since ESFRI Roadmap 2016**



TO SUM UP

- Economists have convinced governments that **investing in science** is the best option for long term sustainable **economic growth**
- But governments still need to be convinced project by project that funding of a **specific project** will have a positive socio-economic impact
- This is why **microeconomic analysis** (for example CBA) and other evaluation methods are increasingly applied to science
- **Socio-economic impact studies increasingly required** by international and national institutions to fund large scale research infrastructures
- **The scientific case comes first, the socio-economic impact case second, along with technical, environmental, legal, political considerations: winning the game on the different dimensions of decision making**

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For other references and tools: <https://cordis.europa.eu/project/id/777563>





Thank you
for your attention

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