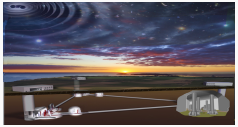

ET: Assessing the economic and social impact

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Plan of the talk

- Where we are
- What is next

Where we are

Existing studies on ET

1. Atzeni, G., Biagi, B., Cuccuru S., Oggiano G., and L. Vargio, 2020. Einstein Telescope: An assessment of its economic, social and environmental impact in Sardinia. Zenodo
2. Van Barneveld, J., Saes L., Oomens, G. Van der Veen, 2018. Impact assessment of the Einstein Telescope. Technopolis Group

- Provide estimates of the demand-driven potential economic effects of ET
- Provide assessments of the social impact on various dimensions

Demand-driven economic impact

- The construction and the operational phases of ET generate a direct demand of intermediate and final goods and services

$\Rightarrow$ The response to that demand would be more production (direct effect)

- That further production requires inputs of various sources including labor
- Therefore,
  1. ET stimulates the economy through direct as well as indirect or induced effects along the supply chain
  2. ET stimulates employment
- Accordingly, the demand-driven economic impact of ET is measured in terms of
  1. Contribution to aggregate output
  2. Contribution to aggregate Gross domestic Product (GDP)
  3. Contribution to employment

Estimation of the direct and induced impacts

- Aggregate vs sectoral data
- Aggregate approach
  - Estimate the demand of goods and services directly associated with the construction and operation phases (Direct effect)
  - Use estimates of the average multiplier effect to determine the overall demand-driven impact by applying the multiplier to the direct effect
- Disaggregated approach: Sectoral data (different industry and service sectors of the economy)
  - Estimation of the sectoral composition of the demand of good and services associated with the construction and the operation phases
  - Estimation of the sector multipliers

$$X = AX + Z \Rightarrow X = [I - A]^{-1} Z \tag{1}$$

  - Estimation of the overall impact by sum of sectorial impact obtained by applying the sectoral multipliers to the sectoral demand of goods and services directly associated with the construction and operation phases

Demand-driven economic effects of ET

Table 1: Construction phase (9 years duration, amounts reported in billions of €)

	Sum of annual flows	Present Value
Total Output	**6,184**	**5,497**
Value added	**2,263**	**2,012**
Yearly FTE units of labor	**36,085**	

Table 2: Operational phase (Amounts expressed in millions of €)

	Annual flows
Total Output	**127**
Value Added	**45**
Yarly FTE units of labor	**713**

- Local impact: construction (65%), operation (50%)

Beyond multipliers: Social impact

Evaluations based on 5 dimensions

1. Scientific impact
2. Skills development
3. Technological spillovers
4. Scientific attractiveness
5. Other social impacts

What is next?

Revision of the estimation of demand-driven economic effects

- Update of the estimations of the demand of good and services at sectoral level associated with the construction and operational phases based on the the available information
- Sources of information: State of the art construction project, experts' opinion, accounting information from other operating infrastructures

Strengthening the assessment of the social impact

1. Scientific impact
2. Skills development
3. Spillovers on existing firms: ① Procurement effects; ② Learning and innovation; ③ Exposure to new markets
4. Externalities:
   - Firm creation
   - FDI effects
   - Patents
   - Upgrade of local services
   - Environmental impact

Possible useful approaches

- Computable general equilibrium models (short vs long run impacts)
- Econometric studies based on micro data including ad hoc surveys (especially useful for specific dimensions of social impact, with particular reference to spillover effects)
- Cost-benefit analysis
- Scenario analysis