

# Estimating the economic effects of a novel research infrastructure

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Luca Deidda<sup>1</sup>

<sup>1</sup>Università di Sassari, CRENoS

# Background

- A new research team led by Luigi Guiso (EIEF), including Giovanni Carrosio (Un. Trieste), Francesco Decarolis (Un. Bocconi), Alessandra Faggian (GSSI), Gianmarco Ottaviano (Un. Bocconi) is at work to produce a new report on the economic impact of ET
- We are building on the previous report by Atzeni et al. (2019) <https://zenodo.org/record/3895752.X8E88KpKjxo>, with important new insights
- What I would like to discuss here is the directions we are currently working on

1. Strategic features of the Sardinia candidacy
2. Short-run vs. Long-run economic effects
3. Impact on local communities

# Why in Sardinia? The value of silence

- Two guards of silence
  - The geophysical characteristics
  - The socio-economic characteristics: Low population density and low economic activity [▶ See Graph](#)
- The absence of noise due to these characteristics of the island has powerful economic implications
  - One can try and reduce noise, but it can be very costly (infinitely costly if the problem is effectively unsolvable)
  - Low human density (and low economic activity) help reduce the opportunity costs related to alternative uses of land

## Why in Sardinia? Other comparative advantages

- The relatively low level of economic development implies that the significance of the economic impact of a successful public investment is larger than it would be in alternative, more developed locations
- Presence of relevant local human capital due to traditional economic activities, including mining, stone carving, and transportation
- The development of a knowledge-based society is key to the smart specialization strategy pursued under the 2021-27 EU program, with investment for scientific research, technological development, and innovation accounting for EUR 128.7 mil, 13.8% of total funding)
- High density of cultural goods

# Short-run effects

- A simple model of GDP determination

$$Y_t^D = C_t + I_t \quad (1)$$

$$Y_t^S = F(K_t, L_t, A_t) \quad (2)$$

$$Y_t^S = y_t^D$$

- Short-run: Demand-induced effects ▶ figures from previous study

$$\uparrow Y_t^D \Rightarrow K_t \uparrow, L_t \uparrow \Rightarrow Y_t^S \quad (4)$$

- In the long run, these effects become significantly smaller as the demand for goods and services will fall
- In the end, the only demand left would be that for the functioning
- Moreover, one has to think that all this public expenditure, other things equal, will be financed through future taxes
- Other things equal.... But, in the case of ET, the things are not equal

## Long-run economic effects

- Constructing and operating ET requires huge achievements in terms of new technologies and competencies
- Therefore, ET will not only push the frontier of scientific knowledge but also that of productivity,  $A_t \uparrow$
- Higher productivity delivers higher levels of output (GDP) permanently, not just in the short-run
- The mechanisms through which this happens are more difficult to identify, and therefore, these long-run effects are more difficult to pin down
- However, they are the most important effects of the infrastructure since they are long-lasting

# Improving the estimation of the short term effects

- The short-term impact is not the most important one for economic development
- Yet, it is important from the political point of view because
  - Its estimated value can be quantified using standard techniques and expressed in a familiar way (effect on economic activity per sector, employment, and so on) that makes the potential impact very “tangible”
  - The beneficiaries can be identified (sectorally and geographically)
  - It is short-term so that it affects the way incumbent politicians (responsible for the decision on whether to construct ET and where) are perceived by citizens
  - That is why it is very important to quantify the short-term impact



# The geography of the short term effects

- As we said, the significance of the impact of such public investment is much larger in Sardinia than in alternative, more developed locations
- That is another reason why a benevolent planner pursuing the official objective of EU policies should choose Sardinia
- However, incumbent politicians are not benevolent since their voters are not altruistic
- A crucial issue, then, is evaluating not only the aggregate magnitude of such impact but also its sectoral and geographical distribution
- We are devoting significant space to discuss this aspect to show that the impact is significant both for the hosting region as well as for strategic sectors of partner countries

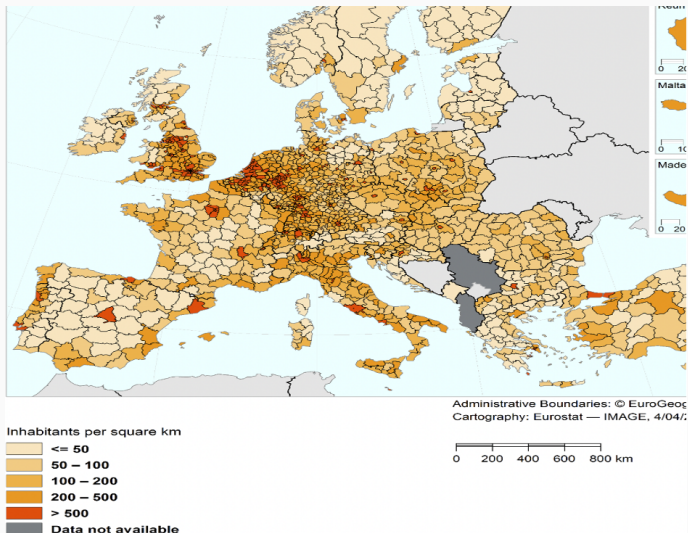
## A new analysis of the long term effects

- In politics, there is often tension between short-term and long-term views
- The long-run effects of ET are a key contribution to the long-term vision of a European knowledge society
- A sharp discussion of these long-run effects helps politicians to internalize the long-term consequences of their decisions about ET
- We are working to provide a systematic analysis of these effects along the following dimensions
  - Scientific impact
  - Skill development
  - Technological spillovers
  - Scientific attractiveness
  - Other social impacts

# Impact on the local communities

- Socio-economic analysis of the hosting area
- The role of ET within the logic of policies meant to reverse trends of marginalization
- Social acceptability of the project

# Human density



# Human density and activities



▶ go back

**Table 1:** Construction phase (billions of )

	<b>In 2019 euro</b>	<b>Present Value</b>
<b>Total output</b>	<b>6,184</b>	<b>5,497</b>
<b>Value added</b>	<b>2,263</b>	<b>2,012</b>
<b>FTE labor units</b>	<b>36,085</b>	

Table 2: Operating phase (millions of )

	<b>Annual flow</b>
<b>Total output</b>	<b>127</b>
<b>Value added</b>	<b>45</b>
<b>FTE labor units</b>	<b>713</b>

- Local impact: construction (65%) operating (50%)