

ESA CM22 ECONOMIC IMPACT REPORT

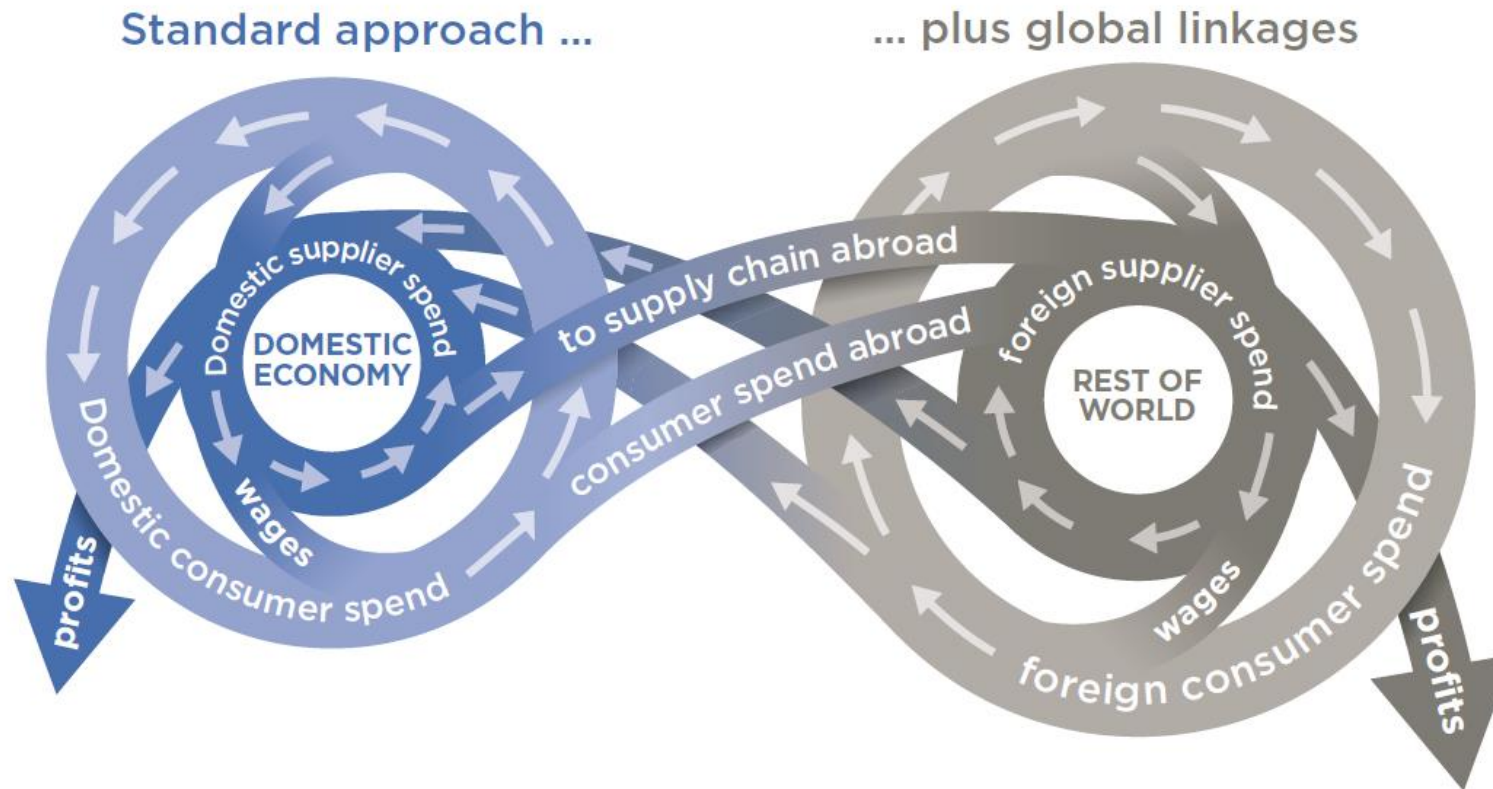
Overview of approach

NOVEMBER 2024



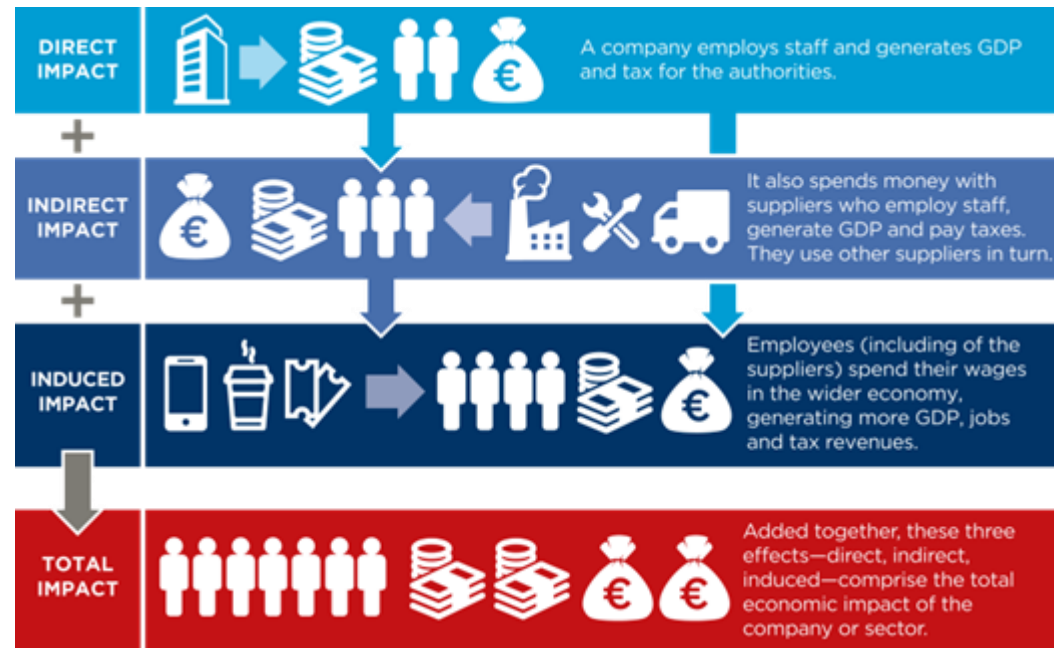
The Global Sustainability Model (GSM)

- Captures spending flows within countries and across their borders



Economic impact uses the familiar EI framework

- The model uses the direct, indirect, and induced channels.
- It produces results by country and industry for
 - Economic impacts: GVA, tax, jobs
 - Social and environmental impacts





Specific model for ESA

Data limitations for the space sector

- ESA are interested in understanding how its funding will drive impact across the broader economy.
- To do this we need to know GVA to output ratios, and intermediate consumption by product.
- Challenges to this include:
 - **Limited availability of consistent national data on space activities** – Quality and coverage of measurement of space activities varies across countries and over time, so no existing source of consistent data on space-related activities for ESA Member States.
 - **ISIC/NACE does not narrowly define the space economy.** Many of the four-digit ISIC codes identified by OECD as relevant for space activities only partially related to space products and services.

Developing a scaling approach

- ESA provided spending data identifying **14 sectors** which are related to space to varying degrees.
- We searched for statistical data that could demonstrate the relative importance of ESA's 14 sectors in relation to the broader sectors which are captured in the GSM.
- This approach involved mapping the specific space activities to the most relevant broader sectors in the GSM (which includes 36 aggregated industry categories, based on ISIC Revision 4 classifications); identifying the most comparable statistics comparing output, GVA, COE and GOS for each specific and broader sector, and using these ratios to scale the input used to estimate direct GVA and an average procurement profile for the specific space sectors.
- Two data sources were used for scaling:
 - **Eurostat:** Use Table, estimated output, GVA, COE and employment for five specific space sectors.
 - **Bureau of Economic Analysis (BEA):** Use Table for seven specific space activities.

Defining the scope of ESA activities

- Based on programme funding information provided by ESA, the scope of space-related activities to be captured in the impact analysis is set out in the table.
- Across the total package of ESA programme funding subscribed to at Ministerial Council 2022, the largest share of funding was allocated against **spacecraft and launch vehicle manufacture** (approximately 50% of total programme funding, allocated against NACE 30.31), alongside **scientific research and development** (approximately 30% of total programme funding, allocated against NACE 72).

| NACE code | Description |
|-----------|---|
| 30.31 | Manufacture of civilian air and spacecraft and related machinery |
| 72 | Scientific research and development |
| 51.22 | Space transport |
| 26.70 | Manufacture of optical instruments, magnetic and optical media and photographic equipment |
| 61.10 | Wired, wireless, and satellite telecommunication activities |
| 61.90 | Other telecommunication activities |
| 33 | Repair, maintenance and installation of machinery and equipment |
| 33.16 | Repair and maintenance of civilian air and spacecraft |
| 71.12 | Engineering activities and related technical consultancy |
| 71.20 | Technical testing and analysis |
| 26.30 | Manufacture of communication equipment |
| 82 | Office administrative, office support and other business support activities |
| 62.20 | Computer consultancy and computer facilities management activities |
| 42 | Civil engineering |

Example: Scaling NACE 72 – Scientific R&D

- 30% of the funding from European Space Agency goes to 'Scientific research and development' (NACE 72). However, the GSM combines sectors 69 to 82 when doing the modelling.
- We use Eurostat to gather spending and GVA information for NACE 69, 72, 73, 82 (Legal, accounting and tax consultancy, Scientific research and development, advertising and market research, administrative and support service activities) for all the relevant countries.
- For each country, we sum up across NACE 69, 72, 73, and 82, and calculate ratios ("scalers") to understand the difference between NACE 72 and this aggregate.
- This allows us to create NACE 72-specific spending profiles and GVA profiles for all the relevant countries, which can be used as inputs once we know the European Space Agency funding amount.



Appendix

ESA sectors were mapped to closest available data

| ESA sectors (NACE) | Broader sector (GSM) | Source | Scaling approach |
|---|----------------------|----------|---|
| 30.31 Manufacture of civilian air and spacecraft and related machinery | 30 | BEA | Compare 'Guided missile and space vehicle manufacturing' (NAICS 336414) to 'Manufacturing of other transport equipment; (NAICS D30) |
| 72 Scientific research and development | 69T82 | Eurostat | Compare 'Scientific research and development' (NACE 72) to the sum of NACE 69, 72, 73, 82 (Legal, accounting and tax consultancy, Scientific research and development, advertising and market research, administrative and support service activities) |
| 51.22 Space transport | 49T53 | BEA | <i>Assumed as above for 30.31</i> |
| 26.70 Manufacture of optical instruments, magnetic and optical media and photographic equipment | 26 | BEA | Compare 'Optical instrument and lens manufacturing' (NAICS 333314) to 'Computer, electronic and optical products' (NAICSD26) |
| 61.10 Wired, wireless, and satellite telecommunication activities | 61 | BEA | Compare 'Satellite, telecommunications resellers, and all other telecommunications' (NAICS 517A00) to 'Manufacturing of other transport equipment' (NAICS D61) |
| 61.90 Other telecommunication activities | 61 | BEA | <i>Assumed as above for 61.10</i> |
| 33 Repair, maintenance and installation of machinery and equipment | 31T33 | Eurostat | Compare 'Repair and installation of machinery and equipment' (NACE 33) to the sum of NACE 31, 32, and 33 (including manufacture of furniture, other manufacture e.g. jewellery, repair and installation of machinery and equipment) |
| 33.16 Repair and maintenance of civilian air and spacecraft | 30 | BEA | <i>Assumed as above for 30.31</i> |
| 71.12 Engineering activities and related technical consultancy | 69T82 | Eurostat | Compare 'Legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis' (NACE 71) to the sum of NACE 69, 72, 73, 82 (Legal, accounting and tax consultancy, Scientific research and development, advertising and market research, administrative and support service activities) |

ESA sectors were mapped to closest available data (cont.)

| ESA sectors (NACE) | Broader sector (GSM) | Source | Scaling approach |
|--|----------------------|----------|---|
| 71.20 Technical testing and analysis | 69T82 | Eurostat | Compare 'Legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis' (NACE 71) to the sum of NACE 69, 72, 73, 82 (Legal, accounting and tax consultancy, Scientific research and development, advertising and market research, administrative and support service activities) |
| 26.30 Manufacture of communication equipment | 26 | BEA | Compare 'Broadcast and wireless communications equipment' (NAICS 334220) to 'Computer, electronic and optical products' (NAICS D26) |
| 82 Office administrative, office support and other business support activities | 69T82 | Eurostat | Compare 'Administrative and support services' (NACE 82) to the sum of NACE 69, 72, 73, 82 (Legal, accounting and tax consultancy, Scientific research and development, advertising and market research, administrative and support service activities) |
| 62.20 Computer consultancy and computer facilities management activities | 62T63 | NA | No adjustment, apply broader sector ratios for 'Information technology services' and 'Other information services' NACE 69 to 63) |
| 42 Civil engineering | 41T43 | NA | No adjustment, apply broader sector ratios for 'Construction of buildings', 'Construction of other civil engineering projects' and 'Specialised Construction Works; (NACE 41 to 43). |

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