

Space Ecosystem as a key sector for industrial policy: evidence from a SAM“Macro Multiplier Analysis

Topic: Input-Output Modelling: Industrial policies

Author: Giacomo Bellucci

Co-Authors: Claudio SOCCI, Francesca SEVERINI, Frida PAOLELLA, Ianfranco ZUCCONI, Rosita PRETAROLI, Stefano DERIU

The rapid expansion of the space economy has intensified the need for analytical frameworks capturing its macroeconomic relevance and supporting evidence-based policymaking. As space-related activities increasingly permeate production systems, innovation trajectories and public policy domains, understanding their structural configuration, inter-industry linkages and economy-wide impacts becomes essential for effective industrial, fiscal and innovation strategies. However, measuring the space economy remains methodologically challenging due to its partial invisibility within standard statistical classifications and the fragmentation of its value chain across heterogeneous industries. These limitations hinder policymakers’s ability to assess the systemic importance of space activities and evaluate targeted interventions. In this context, the paper develops a multisectoral analytical framework to assess the economic relevance of the Italian space ecosystem and its role in national income generation.

The study builds on the Social Accounting Matrix (SAM) for Italy derived from the FIGARO-NAM database (2025 edition), providing a coherent representation of production, income distribution and institutional accounts. The SAM framework is well suited to analysing highly interconnected sectors, capturing the circular flow of income among industries, households, firms and government. To evaluate the propagation of sector-specific shocks and the systemic relevance of space activities, the study integrates the Macro Multipliers (MM) approach (Severini et al., 2020). This method identifies structural patterns in the response of industries and institutional sectors to exogenous policy impulses. The combined SAM-MM framework allows the space sector to be analysed not only as a production domain but also as a generator and transmitter of income across institutional sectors, providing a comprehensive view of its macroeconomic role.

The space sector is defined according to the OECD (2021) conceptualisation, including public and private activities related to the design, production and use of space-related goods and services. This definition highlights the structural complexity of the sector, encompassing upstream manufacturing segments such as satellites, launch vehicles and ground infrastructure, and downstream applications in communication, navigation and Earth observation. These services rely on space-based infrastructures and generate spillovers across the economy. However, such activities are not fully observable as autonomous branches in national accounts and are typically embedded within broader industrial classifications. While this does not prevent estimation of the sector’s aggregate size—around EUR 8 billion in output and about 23,000 employees in Italy (ISTAT, 2025)—it limits the availability of inter-industry technical coefficients and complicates structural dispersion analysis.

To address this limitation, the paper reconstructs the Italian space value chain through a bottom-up procedure integrating statistical and administrative sources. The reconstruction follows a hierarchical mapping strategy identifying core activities, upstream suppliers and downstream applications, ensuring consistency with the OECD definition and national accounting aggregates. This approach allows estimation of output, value added, factor composition and demand structure for the space ecosystem, which are then allocated within the SAM framework. The resulting representation captures the constellation-like nature of the sector as a set of interdependent activities whose economic behaviour cannot be reduced to a single industrial branch.

Once the space value chain is embedded in the SAM, the MM approach is applied to assess whether space-related industries exhibit distinctive propagation patterns under exogenous demand shocks. The analysis identifies industries acting as key transmission channels for space impulses

and those benefiting most from the expansion of space activities, providing insights into the sector's structural position within the Italian economy.

The results are complemented by a policy simulation evaluating the macroeconomic effects of a coordinated public-private investment programme targeting space demand. The exercise estimates how such a demand shock propagates along the reconstructed value chain, highlighting the sector's systemic role in terms of production activation, employment creation and income generation.

Overall, the paper proposes an operational methodology to represent the space economy within national accounts and assess its macroeconomic significance despite classification constraints. By integrating the SAM framework, the MM approach and the bottom-up reconstruction of the space value chain, the analysis provides a consistent tool for evaluating demand-oriented industrial policies and their potential to strengthen the space ecosystem and its contribution to national economic development.