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The space economy: what are the socio-economic impacts? (3)

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THE IMPORTANCE OF THE TECHNOLOGICAL SPILLOVERS FOR THE RETURNS TO SPACE INVESTMENTS, WITH AN EMPIRICAL APPLICATION TO THE ITALIAN HIGH-TECH AND SPACE SECTORS.

Abstract

It is clear that a correct evaluation of the rate of return of a space investment requires to track the forward benefits formation. For this one must look at the chain from the upstream space industry, where a new capital good (a satellite, etc.) is produced, to the downstream sectors, where the services operators and various value adding operators bring the benefit to the final consumers. In the first part of this paper we shall see how the computation of the benefit, and its distribution among firms and consumers, can be done in principle. Here we shall use the standard economic analysis of the market mechanisms and the concepts of producer and consumer surpluses. Nevertheless, given that the benefits of many space investment take the form of collective rather than private consumption, we shall consider also methods to reveal personal preferences for public goods and services. This part will be concluded with a survey of some significant studies which have succeeded in getting interesting results by using the methods previously described, though in approximate versions. In the second parte of the paper we shall look at the fact that space investments are essentially R&D investments, undertaken to produce new goods (a new satellite, or software, or a new production procedure, etc.), and that the knowledge embodied in them is a good, "non rival" in production. Hence the possibility arises of a lot of "external" returns on those investment, which must be added to the original private return and to the returns for the downstream users. These spillovers have been noted and their impacts have been evaluated in a number of studies focused on firms within the space sector itself; but they are potentially much more relevant when they intersect a variety of industries. In the third part of the paper we shall use a standard economic model to estimate the impact of these general spillovers on labour (or total factor) productivity growth, which is a key determinant of increases in the welfare of a nation. We shall apply the model to data on the Italian manufacturing sector in the last 30 years, paying special attention to the spillovers relationships between the group of the high-tech sectors, which include the space industry, and the rest of the manufacturing sector. Together with the empirical estimates of the spillovers' impact, we shall seek to highlight the factors which favor them.