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Editorial

Analyzing the Evolution of Aerospace Ecosystem Development

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EDITORIAL

The aerospace manufacturing business is expected to expand further. Rising demand is causing the present global aerospace ecosystem to develop and adapt to new challenges. New participants in the aerospace manufacturing sector, as well as the creation of new ecosystems, are demonstrating the industry's transformation. As they acquire a higher revealed comparative advantage (RCA), countries tend to become more nested in their aerospace product space. It has been shown that, while nations gain an edge in developing distinctive products, they also tend to enhance rivalry with one another. Further analysis reveals that manufactured products have a stronger correlation to an aerospace ecosystem than primary products; and the automotive sector, in particular, has the highest correlation with positive aerospace sector evolution. Even though market demand is increasing, the aerospace ecosystem has not been able to respond in a timely manner.

Aircraft manufacturers have regularly claimed insufficient capacity to meet manufacturing demands, with a record high commercial aeroplane backlog of over 14,000 units in 2018. Key impediments, such as the significant expenditure required for the creation of new players and the transfer of production facilities, have stifled its progress. Despite the restrictions, there are countries and businesses that have surmounted the previously listed obstacles. For illustration, the entry of new actors into the aerospace manufacturing sector, as well as the creation of new ecosystems through the relocation of production facilities to growing aerospace manufacturing nations like as Mexico. Indeed, the present global aerospace ecosystem is intertwined with the need to evolve and adapt to new problems. Understanding how the aerospace ecosystem has evolved is so critical in order to provide ideal circumstances for its expansion. Understanding industrial ecosystems through network science has lately piqued the interest of academics, since it is seen as a strong way to representing, analysing, and forecasting its evolution.

Similarly, this study use network science to aid in the creation of new aerospace ecosystems by studying how mature aerospace ecosystems have evolved. Data from the United Nations (UN) Comtrade database were collected from 1992 to 2016. Two sets of nations were chosen using an RCA analysis. One set of nations has continuously been among the top aerospace exporters, while another group has seen considerable progress in aerospace exports (we supplemented the study by finding all other goods with an RCA>1 for each selected country). In order to identify trends across different time periods, the 25-year data set was split into intervals of equal length. To develop the analysis, five five-year periods were chosen. There are two commodity categories available: Harmonized System (HS) and SITC. The first is mostly utilized by governments to compile trade statistics. The latter, which was used for this investigation, is maintained by the United Nations (UN) and is recommended for analytical purposes.

There were four revisions of the SITC nomenclature available at the time data was collected: revision 1 had data from 1962, revision 2 contained data from 1976, revision 3 contained data from 1986, and revision 4 contained data from 2007. Revision 3 was chosen since it is the most recent categorization containing almost twenty years of historical data. This study's nestedness analysis also helped to show that mutualistic interaction patterns discovered in species-species networks may be found in networks of other types. The nestedness patterns discovered in the country-product networks created in this study are notably consistent with the notion that the most common interactions occur between generalists and specialists, and that specialists are mostly connected to generalists. Previous findings are also consistent with research on networks from other industrial sectors, such as inter-organizational networks and automobile networks. Patterns seen in manufacturer-contractor contact networks, for example, are comparable to mutualistic interaction patterns discovered in species-species networks. Patterns discovered in automotive supply chain networks demonstrating that generalist firms are the only ones manufacturing specialist products and that specialists compete almost entirely in the generalist products market.

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