Chapter 50
An International Trade Comparison of Two Supposedly Different Sectors:
An Investigation on Inter-Sectoral Diversity and Sectoral Trade Stability

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ABSTRACT

According to modern international economics, and especially evolutionary economic geography, a country industry characteristics influence the structure of its international trade. Following this view, this chapter moves from the following basic research issue: if two sectors are very different according to market, economic and technological aspects, should we expect that its corresponding international trade networks are as well markedly different? Aerospace and Common Earth Materials seem quite different in those respects, and thus, they are good candidates to explore that research issue. Its comparison allowed to evidence and discuss some methodological problems in applying social network analysis, and especially in using it to compare different networks. In particular, it is underlined the difficulty to handle valued networks when value variance is very high, and to combine three groups of indicators: simple, hierarchy focused, and strictly topological. The comparative analysis employed 32 indicators either at network or sub-network level, like for core-periphery analysis, which indicate clear and marked diversity only in terms of hierarchical degree and topological aspects. A first conclusion is that the two examined trade networks are following a similar path and, excepted for few indicators, they seem to be rather similar even at a deeper structural level. Hence, one (or more) of three implications can be drawn: 1) the global value networks corresponding to the two sectors are not so markedly different; 2) they are substantially different but such a diversity does not produce a significant difference in terms of international trade networks; 3) there are some methodological problems that prevent differences to be evidence and require a more refined and modified comparison. A second conclusion is that trade patterns of both sectors are rather unstable.

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INTRODUCTION

As discussed in the previous chapter (see Angelini & Biggiero), during the last 15 years social network analysis has been repeatedly applied to different aspects of international trade (Kali & Reyes, 2007; Kali *et al.*, 2007; Fagiolo *et al.*, 2009; Serrano & Boguñà, 2003; Serrano, 2007; Serrano *et al.*, 2007). This complex system is composed by thousands of different commodities, each with its specific characteristics and its specific trade network. Commodities are grouped into sectors, and depending on the level of aggregation hundreds or dozens or few sectors are generated. In the perspective of social network analysis each sector is represented by a trade network, with its peculiar topology and dynamics. The understanding of each sector/network is already rather complex, being international trade the result of the interplay of many (economic and non-economic) variables. For the whole world trade web is the outcome of summing up all commodities trade, though many excellent studies have worked at such an aggregate level, sectoral analysis and comparisons could substantially help deepening the analysis at sectoral level.

International trade studies (Bowen *et al.*, 2012; Ethier *et al.*, 1995; Feenstra, 2003; Feenstra & Taylor, 2010; Milberg and Winkler, 2013), and especially evolutionary economic geography (Boschma & Frenken, 2006; Boschma & Lambooy, 1999; Boschma & Martin, 2007; Essletzbichler & Rigby, 2007; Frenken & Boschma, 2007; Martin & Sunley, 2007) suggest that some of the major forces shaping trade patterns are industry structure, its degree of technological complexity, and the distribution of raw resources and competences. Though these are not the only variables, it is reasonable to expect that the trade networks of two sectors particularly different respect to these variables had to significantly differ. These considerations pushed us to choose two very different sectors – aerospace (AS) and common earth materials (CEM) - and then to check if their trade networks differ as well. Further, in order to make the analytical comparison more homogeneous and effective, we run the investigation during the same time span: 2002-2006.

Another theoretical perspective involved into this work is that of global value chain (Gereffi, 1999; Gereffi *et al.*, 2005; Humphrey, 1995; Humphrey & Schmitz, 2002; Milberg & Winkler, 2013), which expands the idea of domestic industrial domestic filière to that of global filière, where various kinds of production and distribution activities are realized not only by large multinational corporations but also by competitive small and medium enterprises, especially in high-tech industries. A further advancement on this research area is that globalization – mostly on the demand side - and localization – mostly on the supply side – can co-exist in a continuous restructuring of the global filière. In this evolutionary process, industrial clusters progressive opening to multinationals and its digitalization are playing a decisive role (Biggiero, 2002, 2006). AS is a paradigmatic example of this kind of evolution: an extremely high-tech and globalized industry that is structured into industrial clusters (Acha *et al.*, 2007; Alberti & Pizzurno, 2015; Alfonso-Gil, 2007; Beaudry, 2001; Biggiero & Angelini, 2015; Biggiero & Sammarra, 2010; Broekel & Boshma, 2011, 2012; Caroli, 2006; Cooke & Ehret, 2009; Eriksson, 2000; Giuri *et al.*, 2007; Jackson, 2004; Longhi, 2005; Lublinsky, 2003; Niosi & Zhegu, 2005; O'Sullivan, 2006; Sammarra & Biggiero, 2008; Smith & Ibrahim, 2006). In this perspective, a sectoral international trade is supposed to be strictly specific to its corresponding global value network, because the distribution of exchanges should be strongly conditioned by the distribution of clusters between countries, the inter-clusters exchange, and finally the localization of demand. Hence, these approaches emphasize *rationales to expect a high degree of diversity between international sectoral networks corresponding to different global value networks*.