

Minimum spanning tree of the world trade web - Abstract

In this manuscript analysis of undirected weighted graphs which represent the world trade web in years 1950-2000 has been performed. Nodes indicate countries. Edges represent trade connections between countries. To every edge weight is assigned. This weight corresponds to trade volume. This analysis allows one to identify the most important trade channels. In this manuscript this thesis is confirmed. It was achieved using transformation of network to minimum spanning tree which imitates its backbone. Firstly, analysis of graphical representation of minimum spanning tree for years 1960 and 2000 has been done. Also some parameters of the network for years 1950,1960,...,2000 were obtained. Those parameters were: number of nodes, sum of weights and number of edges in minimum spanning tree in comparison to full graph. Finally analysis of cumulative distribution of edges weights for several years was performed.

Analysis of minimum spanning tree presumed rough identification of mayor trade channels. Moreover, there was observed that political, economical and historical factors had huge impact on shaping network backbone. On the basis of the network parameters some additional conclusions could be made. It is for example dominant position of the countries with the biggest world economies. Analysis of cumulative distribution function of edges weights led to conclusion that the world trade network is scale-free. Obtained results had been compared with results reported in other publications related to the same topics. Congruity of the results confirmed truthfulness of the conclusions in this manuscript.

Keywords:

Complex networks, world trade web, international trade network,

minimum spanning tree, power-law distributions.