Struggle for existence in the world economic ecosystem

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The global trade network is a highly dynamical system, with the constant emergence of new products and technology progress.
The commercial relationships between countries depend on a variety of parameters like supply and demand, price difference, product quality and geographical location. In the global trade market there is constant competition between exporting countries. We are particularly interested in cases when this competition affects dramatically the export of the one of the countries.
We think that the economies are like predators, and they are able to displace weaker economies in many markets. A prey is defined as a pair (importer, product).

We test this theory by creating *"predation network"*, connecting country a to country b if a's appearance in a market preceded b's disappearance. This is related to multilayer network [1, 2] and signed network analysis [3, 4].

To better understand how the procedure works, we present a particular example. We consider the car market (SITC code 7810) in the United States (USA as importer). We observe that in the year 1964 the roles of Japon and Italy were switched. We focus on Japan as a potential predator in this prey (the pair USA, car market), and Italy as competitor, Figure 1 depicts the share of USA car market of Japan and Italy. We will consider that Japon was predator of Italy, only if the decrease of the exports of Italy are connected with the increase of the exports of Japon.

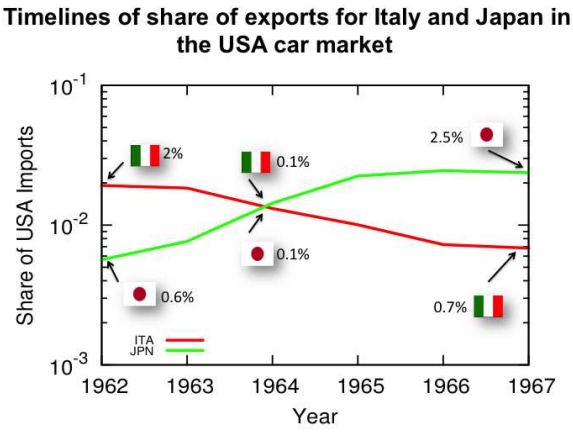

Figure 1: Timeline of Japan's and Italy's exports in the US car market in the 60s.

To establish if the countries (a and b) are actually in a predatory competition, with a pair importer c -product p as prey, there are several requirements to be satisfied:

1. c must have not stopped importing p;
2. a has to have ceased to export p to c
3. b still has to be exporting the product, this is the potential predator exporter;
4. The cessation of exports from the a must have been longer than a certain number of years.

We focus on longitudinal, multiplex data on commercial relations, to test the presence of predator countries in the course of time. We consider their relation to the complexity of products and national economies, predict which countries are leading the global trade network and which countries are at risk of being predated in different dimensions.

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