Trade Cartograms: a Graphical Method for Dyadic Datasets

Benjamin Mazzotta[1*]

1. Fletcher School, Tufts University
* benjamin.mazzotta@tufts.edu

This paper proposes to create a complete set of annual cartograms for world trade by partner country from the IMF's Direction of Trade Statistics, with one plot for each country's trade relationships in a given year. The primary method is the Newman-Gastner diffusion cartogram algorithm, implemented variously as Mark Newman's *cart* software (Gastner and Newman 2004), and as Tom Gross' ArcGIS script. Dyadic datasets are often aggregated due to the difficulty of presenting the information graphically. This set of cartograms would constitute a set of reference images akin to the S. Louis Federal Reserve's FRED charts for national economic data series.

Cartograms have been widely exploited for the purpose of comparing distributions of national variables. For example, *The Atlas of the Real World* is a collection of cartograms of national population, education, infrastructure, and many other statistics. Cartograms retain basic geographic information that other graphical methods, such as balloonplots, lack. Conversion of dyadic datasets to national aggregates is the default for GIS, resulting in a graphic that ignores that variation across each nation's partners. One cartogram per country, as I propose, would instead highlight the variation across partner countries.

Diffusion cartograms are computationally tractable with desktop computers. A variety of methods exist for extremely simple implementations of this approach, notably ScapeToad and Frank Hardisty's Cartogram Site. Statisticians can present intertemporal and international comparisons with a complete series of cartograms for each country. Simple animations are possible. Worldmapper's animations are even more creative, comparing the distribution of national populations conditional on per capita income. R's **GIS** package transformed the IMF trade data into GIS layers. I used ArcGIS for mapping.

References

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ScapeToad - cartogram software by the Choros laboratory. http://scapetoad.choros.ch/.

Worldmapper: The world as you've never seen it before. http://www.worldmapper.org/faq.html.