

# Abstract for Workshop on Economic and Financial Networks at NetSci-X 2020

Ludvig Holmér

## Modelling trade dynamics on a network using statistical physics

Classical trade models usually deal with static equilibria in order to determine how the parameters affect these equilibria. In addition, the trade networks that we observe empirically are often not taken into account. But recently a literature dealing with empirical trade networks have found that network topology is an important factor in determining trade [De Benedictis and Tajoli, 2011] and that empirical models that take networks into account outperform the more traditional gravity models [WARD et al., 2013]. There is also a growing body of research using statistical physics to model how beliefs spread in a social network, for example Galesic and Stein.

Currently I am on a research project, which sprung from CSSS 2019 at the Santa Fe Institute, that also model how beliefs (specifically beliefs related to climate change) spread through a network. Thinking about this and relating it to my master studies in Economics led me to the following outline of my master's thesis. By drawing upon the research outlined above I will model trade dynamics on a network. Similarly to how beliefs change, it seems likely that preferences also change over time. Therefore my plan is to implement dynamic preferences on a network of trading agents. With this framework there will be a large parameter space to explore, with respect to network topology as well as more traditional economics parameters such as trade costs, as well as functional forms of preferences. It would be interesting to find out which parameters yield a static equilibria similar to those of more traditional trade models, and which parameters that yield a 'chaotic' or non-stationary system.

Although I am a MSc student at the Stockholm School of Economics I am currently on exchange in Tokyo. Ever since I attended the Complex System Summer School (CSSS) this summer where I learnt a lot about network science, a topic that interests me to a great extent, I have thought about how to relate these ideas to economics. The above is the state I am currently at. In January I hope to have a version of the code which implements this up and running and some preliminary results. It would be very interesting to attend this workshop to partake in other people's ideas and discussion as well as getting input into my work.

## References

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