Network formation with value heterogeneity*

Andreas Bjerre-Nielsen
University of Copenhagen, Department of Economics
Oster Farimagsgade 5, 1353 København K., Denmark

A fundamental pattern in social networks is that people associate more with people similar to themselves [3], i.e. they sort according to self-similarity. Despite these findings there is a lack in understanding of whether these sorted network structures are optimal and how sorting is related to network measures - this paper provides an answer to these two shortcomings. Our approach is to model self-interested agents who form or cut ties to other agents and investigate stable and efficient networks. The novelty is to combine agents which are heterogeneous in talent for providing value through a tie [1] with network externalities [2]. We demonstrate sufficient conditions for stable networks to have:

(i) A pattern where more talented agents have a more central network position.
(ii) Sorting in talent and in degree (agents link with other agents with similar number of ties).
(iii) Two generic inefficient networks. A network with excess sorting where more and less talented agents fail to connect as it is not pairwise incentive compatible despite being welfare improving (visualized below). The other inefficient network is where an agent with least talent is the center of a star.

(B): Connected network: efficient for high and mid-level externalities.

References


* A working paper is available at: arxiv.org/abs/1503.07389