Network Formation with Multigraphs and Strategic Complementarities

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Abstract

Economic agents are typically connected to others in multiple network relationships, and the architecture of one network could be shaped by connections in other networks. This paper examines the formation of one network when connections in a second network are inherited under two scenarios:
(i) the inherited network is asymmetric allowing for a wide range of graphs called nested split graphs, and
(ii) the inherited network is a symmetric type of network belonging to a subclass of regular graphs.
Both the inherited and endogenously formed networks are interdependent because the respective actions in each are (weak) strategic complements. This property is sufficient to show that those who inherit high centrality will continue to have high centrality. Additionally, the network formed by the agents induces a coarser partition than the inherited network, suggesting the possibility of being able to improve network centrality, but only in a limited manner. Thus, our analysis explains preferential attachment and why inequality is often entrenched in society, how asymmetries in one network may be magnified or diminished in another, and what determines the identity of players occupying the various vertices of asymmetric equilibrium networks.