Motivated by applications in many economic environments, Bochet et al. [2] generalize the classic rationing model (see Sprumont [4]) as follows: there is a moneyless market, in which a non-storable, homogeneous commodity is reallocated between agents with single-peaked preferences. Agents are either suppliers or demanders. Transfers between a supplier and a demander are feasible only if they are linked, and the links form an arbitrary bipartite graph. Information about individual preferences is private, and so is information about feasible links: an agent may unilaterally close one of her links if it is in her interest to do so. For this problem they propose the egalitarian transfer solution, which equalizes the net transfers of rationed agents as much as permitted by the bilateral constraints. Furthermore, they show that the egalitarian mechanism elicits a truthful report of both preferences and links. In the variant where demanders are not strategic but demands need to be exactly met [1], they propose a similar mechanism for which truthfully reporting the peaks is a dominant strategy, but truthful reporting of links is not.

The key contribution of the paper is a comprehensive study of the egalitarian mechanism with respect to manipulation by a coalition of agents. Our main result is that the egalitarian mechanism is, in fact, peak group strategyproof: no coalition of agents can (weakly) benefit from jointly misreporting their peaks. Furthermore, we show that the egalitarian mechanism cannot be manipulated by any coalition of suppliers (or any coalition of demanders) in the model where both the suppliers and demanders are agents. Our proofs shed light on the structure of the two models and simplify some of the earlier proofs of strategyproofness in the earlier papers. An implication of our results is that the well known algorithm of Megiddo [3] to compute a lexicographically optimal flow in a network is group strategyproof with respect to the source capacities (or sink capacities).

References


