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Three Essays in Network Economics: Two-Way Interconnection, Two-Sided Networks, and Reputation Systems

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Abstract

This thesis analyses three sets of issues that arise in the field of network economics.

The first chapter following the introduction is concerned with modelling partial consumer participation in the context of two-way interconnection in telecommunications. Partial consumer participation is introduced into the model of competition between telecommunications networks developed by Armstrong (1998), Carter and Wright (1999) and Laffont et al (1998a). It is shown that the result that firms are indifferent over the access charge under two-part tariffs no longer holds when there is partial consumer participation. Under some additional simplifying assumptions, it is shown that firms prefer that the access charge is set equal to the marginal cost of termination. Without these additional assumptions the model is analytically complex and numerical simulation results are presented which show that firms prefer the access charge to be less than marginal cost, while the socially optimal access charge is above cost.

The next chapter considers competition between two-sided networks. Firms with two-sided networks facilitate connections or transactions between two distinct populations of consumers. This chapter analyses the behaviour of such firms where there are no intrinsic benefits to consumers other than the network effects, examples of which include employment agencies, real
estate agents and videogame platforms. The modelling framework encompasses both matching service and platform business models and allows for subscription or per-transaction pricing. Three different market structures are considered: monopoly, and duopoly with and without compatibility. Comparisons of prices, profits, consumer surplus, and welfare are made between the three regimes. It is shown that one side of the market generally pays a lower price than the other, and the conditions under which one side of the market is charged a zero price are derived. It is also shown that duopoly with compatibility is socially preferable to the other regimes, while monopoly is socially preferable to duopoly without compatibility.

The final chapter examines the reputation systems that are increasingly accompanying network businesses. This chapter explores the trade-off between the short-term benefits of false quality advertisements by sellers in a market with asymmetric information against the longer term costs of reputation damage. A directed search model is constructed in which submarkets are created by the advertisements and reputations of sellers. A reputation system links misleading advertisements in the present period to a lower reputation in the next period. It is shown that a reputation system always increases the prices of high quality products and directs search more accurately towards the sellers with such products. It is also shown that buyers are hurt by a reputation system if the market is thin – has few sellers – because the equilibrium increase in prices is greater than the equilibrium increase in the quality of trade. On the other hand, it is shown that submarket creation by a reputation system always increases total welfare because buyers’ search is directed more accurately and the number of quality adjusted matches increases. Finally, it is shown that a reputation system which screens for honesty increases social welfare by making sellers more truthful, however, a
reputation for honesty is not always highly valued and an alternative reputation system which screens for type can be more effective.
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