Competition in Service Industries

We analyze a general market for an industry of competing service facilities. Other than through intrinsic and unalterable service characteristics, firms differentiate themselves in the market in terms of their price levels and the waiting time their customers’ experience. Our model therefore assumes that the expected demand experienced by a given firm may depend on all of the industry’s price levels as well as a (steady state) waiting time standard, which each of the firms announces and commits itself to by proper adjustment of its capacity level. We define a firm’s service level as the difference between an upper bound benchmark for the waiting time standard \( \bar{w} \) and the firm's actual waiting time standard.

Different types of competition and resulting equilibrium behavior may arise, depending on the industry dynamics through which the firms select their strategic choices. In one case, firms may initially select their waiting time standards, followed by a selection of their prices in a second stage (Service Level First). Alternatively, the sequence of strategic choices may be reversed (Price First) or as a third alternative, the firms may make their choices simultaneously (Simultaneous Competition). We model each of the service facilities as a single server M/M/1 queueing facility, which receives a given firm specific price for each customer served. Each firm incurs a given cost per customer served as well as cost per unit of time proportional to its adopted capacity level.

In the second part of the talk we discuss generalizations to settings where firms deal with multiple customer segments served through a shared facility or process, as well as those in which the service process at each facility needs to be modeled as a general queueing system. In this context we describe a unified analytical characterization of the capacity –service level tradeoff.