Elasticity based pricing rules in telecommunications – a cautionary note

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Extended Abstract

To recover large common (sunk) costs, telecommunications operators are often recommended to follow an inverse elasticity based pricing; setting the highest markups for the services with the least elastic demand. This is based on the seemingly simple rule for profit maximization proposed in many microeconomics textbooks for marking up marginal cost; \[ p = \frac{1}{1 + \frac{1}{\varepsilon}} mc. \]

This inverse elasticity rule also appears in the well-known Ramsey rule, which has been frequently debated as a regulators tool for curbing monopoly pricing in telecommunications while minimizing deadweight losses.

The inverse elasticity rule is all too often described in a way that implies a myopic application (e.g. Dobson, Maddala, and Miller, 1995, or Mansfield and Yohe, 2000). This is unfortunate, as management in telecommunications and other industries may adopt the rule at face value. The consequences of applying the pricing rule in a myopic manner are found by analyzing the effect on prescribed “profit maximizing” price by the rule following a change in initial price:

\[
\frac{d\hat{p}}{dp} = mc\left(\frac{1}{1 + \frac{1}{\varepsilon}}\right)^2 \frac{\partial\varepsilon}{\partial p} + \left(\frac{1}{1 + \frac{1}{\varepsilon}}\right) \frac{\partial mc}{\partial q} \frac{\partial q}{\partial p}
\]

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In case (i) where initial demand is elastic and elasticity increases in price we get that, (a) if marginal cost is constant, a myopic application of the rule will lead to an overshooting of the profit maximizing price: If current price is below (above) the profit maximizing price, the rule will suggest a price above (below) the profit maximizing price. (b) If marginal cost is increasing, overshooting effect will increase. (c) If marginal cost is decreasing, the overshooting effect will be reduced – and possibly cancelled out or reversed.

In case (ii) where price elasticity of demand is constant and elastic, and (a) marginal cost is also constant, a myopic application of the rule will yield the correct, profit maximizing price – regardless of initial price. However, (b) if marginal cost is increasing, an overshooting will result, and (c) if marginal cost is decreasing, an undershooting of the profit maximizing price will result.

In case (iii) where price elasticity of demand is inelastic and elasticity increases in price, (a) we will get overshooting identical to case (i) for constant marginal cost, but the results are reversed relative to case (i), otherwise. (b) If marginal cost is increasing, we the overshooting effect is reduced, and (c) if marginal cost is decreasing, the overshooting effect will be exacerbated.

In conclusion, with only local knowledge of demand and marginal cost, the rule is difficult to use and will in most cases lead to an overshooting of the correct price. To be effective, the rule requires full knowledge of demand and marginal cost, and as such offers no advantage over the more traditional approach of equating marginal revenue to marginal cost directly.
References


