

## Dynamic Oligopoly with Reference-Price Effects

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**Abstract:** We propose an infinite horizon continuous-time model of oligopolistic competition with differentiated products and reference-price effects. Firms compete either in prices (à la Bertrand) or in quantities (à la Cournot). Consumers have memory of past prices and use past prices to form a benchmark price (the reference price) against which comparing the prices of different product varieties before making a purchase. We derive open-loop and closed-loop (feedback) equilibrium strategies and study the impact of consumers' reference-price effects on firms' behavior. We show that, under both price and quantity competition, reference-price effects are pro-competitive: stationary open-loop and closed-loop prices and profits turn out to be lower than prices and profits in the absence of reference-price effects. We also show that, when the speed of adjustment of the reference price becomes instantaneous, as the magnitude of reference-price effects tends to infinity, stationary open-loop and closed-loop prices converge to the marginal cost (and stationary open-loop and closed-loop profits converge to zero), irrespective of firms' control variable.