

## Dynamic duopolistic competition with sticky prices under uncertainty

Luca Colombo  
Deakin University

Abstract: In this paper, we extend Fershtman and Kamien (Econometrica, 1987) to a stochastic environment. We study a differential game where two quantity-setting firms compete over an infinite time horizon under the assumption that the market price does not adjust instantaneously to the level specified by its demand function and is subject to stochastic fluctuations (governed by a Wiener process). We derive analytically the closed-loop (feedback) equilibrium strategies and the evolution path of the expected price. We show that the expected price converges to a level that can be either higher or lower than the deterministic stationary price, depending on market size. Specifically, we find that demand uncertainty is pro (anti) competitive if market size is relatively small (large). We also show that, in the limiting case in which the speed of adjustment of the price tends to infinity, the expected price converges to the deterministic stationary price and the variance converges to zero.