Consumer Learning of Product Quality with Time Delay: Insights from Spatial Price Equilibrium Models with Differentiated Products

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Abstract:

In this paper, we present spatial price equilibrium network models, both static and adaptive, with differentiated products under perfect quality information for producers and consumers and under quality information asymmetry with consumer learning of product quality with a time delay. The adaptive model with information asymmetry is able to adapt to the uncertainty in consumer learning as well as in supply, demand, transportation cost, and product quality over time. In addition, we provide measures of consumer welfare under perfect quality information and under information asymmetry as well as the value of perfect quality information for consumers. The models are formulated and qualitatively analyzed using variational inequality theory. We establish theoretically and illustrate computationally that, under appropriate assumptions, the equilibrium solution, consisting of supply and demand markets prices, quality levels, and product flows, of the adaptive spatial price equilibrium model with information asymmetry converges to that of the corresponding static model with perfect quality information. The models are especially relevant to agricultural products where spatial price equilibrium models have found wide application. We also present several numerical examples with practical insights provided.

Keywords: spatial price equilibrium, consumer learning, networks, information asymmetry, product quality, value of perfect information, adaptive model