Title: Dynamic Bargaining in a Supply Chain with Asymmetric Demand Information

Abstract: We analyze a dynamic bargaining game between a seller and a buyer, who negotiate over quantity and payment to trade for a product. Both firms are impatient, and they alternate in making a contract offer until an agreement is reached. The buyer is privately informed about his type, which can be either high or low, with respect to the property of the uncertain demand he faces. The demand distribution of the high type is stochastically larger than that of the low type. With some reasonable assumptions on the seller’s belief structure, we find the unique perfect Bayesian equilibrium of the bargaining game that starts with the seller making the first offer. In equilibrium, an agreement is reached after at most two rounds of negotiations. Either both buyer types accept the seller’s initial offer immediately, or only one type accepts the offer immediately while the other type rejects and counteroffers an acceptable contract in the second round. Unlike the one-shot principal-agent model, dynamic bargaining allows the informed firm to signal his demand information through his counteroffer which depends on his endogenous type-dependent reservation profit. We show that the relative patience of the firms and the information structure play a critical role in determining whether a separating or a pooling bargaining outcome will be reached and the associated channel efficiency. Furthermore, as an application, we explore our model to characterize the effect of demand forecasting accuracy on firm profitability, and our result suggests that the effect is drastically different from what was previously reported using a principal-agent model.