

Abstract

In this dissertation, we look at pricing and sourcing strategies of a retailer under supply disruption risk. In the first essay, we study the pricing and sourcing strategy of a price-setting retailer. In the second essay, we look at the pricing and sourcing strategies of the retailer when it is competing against a competitor with a more reliable supply chain. In the third essay, we look at the pricing and sourcing strategies of the retailer when she is competing against a competitor with more reliable supply chain and there are regulatory price constraints in the end market. The last essay looks at the optimal price constraint that can be imposed in a duopoly by a regulator when there is supply risk resulting in price fluctuation(s).

The first essay is motivated by the price fluctuation in the market in case of supply disruption. We find that the retailer should source mainly from a risky but cheap supplier when the probability of disruption is low. When the probability of disruption increases, it is optimal for the retailer to use dual sourcing where part of the order is sourced from a reliable domestic supplier. We find that when customers are price sensitive, the retailer is forced to source from the cheap but risky supplier to maintain lower prices. In a large market, the retailer places a larger order with the reliable supplier, since, the focus of the retailer is on retaining the market share.

In the second essay, we study how a retailer can use pricing decisions along with sourcing strategies under disruption risk while competing against another retailer with a more reliable supply chain. Supply disruption has become a critical concern for businesses around the world. The extant literature has dealt mainly with the sourcing decision for a price-taking retailer. The retailer uses two decision levers namely, price adjustment, and split of order between reliable but expensive supplier and/or cheap but unreliable supplier to compete in the end market. Our analyses show that the competitive dynamics are shaped by the cost structure of the players, relative market potential and disruption risk. We find that the retailer focuses on reliable supplies with less price adjustment when it enjoys procurement cost advantage and higher market potential. On the other hand, as the procurement cost advantage and market potential shifts to the competitor; the retailer opts for cheaper but risky supplies and relies on drastic price adjustments. These results have significant managerial implications and provide critical guidelines for retailers involved in pricing and sourcing decisions under the threat of supply disruptions.

In the third essay, we analyse the optimum pricing and ordering behaviour of the retailer when she is competing against a player with a more reliable supply chain. Also, both the retailers are facing price constraints in the end market placed by the regulator/social planner. When hurricane Katrina hit the United States, it resulted in price rise of gasoline in multiple states. The state of Hawaii was protected by the law that restrained the retailers from charging a higher price. The uncertainties in demand and supply cause fluctuation in end market prices. The practice of raising prices more than to cover the increased cost of providing extra goods in the market during an event of disruption is called price gouging. We find that the expected profit of the retailer is non-increasing against regime parameter in both the regimes whereas in case of dual-sourcing, it increases and stabilises after that with respect to regime parameters. The competitor, on the other hand, enjoys non-decreasing profit function when the

retailer uses single sourcing from foreign supplier and dual sourcing. Lower regime parameter values force the retailer to go for supplies from the unreliable supplier. Once the regime parameters are relaxed, the retailer moves to more stable supplies.

In the final essay, we look at the price constraints from social planner's point of view. In this essay, the regulator/social planner is Stackelberg leader whereas the competing retailers in a duopoly are followers. The retailers optimise their prices and sourcing strategy. The regulator aware of the optimisation of the retailers sets price constraint that optimises the social surplus. The social-surplus is taken as the weighted sum of profit of the retailers and consumer surplus. We find that regulators should impose tighter price constraints in the market where supply risk is very low whereas the price constraints should be liberal when the supply risk is higher. This happens because when supply risk is low and a supply disruption occurs for one of the retailers, it will result in huge price rise which is further passed on to the consumers. In case of medium and high risk, retailers hedge supply risk at their ends and the price fluctuation is minimal. We find that multiplier price regime (MPR) results in higher social surplus when the market is small and supply risk is lesser. The maximum retail price regime(MRPR) performs better for large markets and high supply risk. Also, MRPR results in more stable prices than the MPR.