

Essays on sustainable operations

Abstract

Operations management researchers and practitioners have been continuously striving to integrate the concept of sustainability with the traditional operational objectives. Firms have started reporting their efforts to improve their social and environmental performance along with the economic performance in their annual reports. They have realized that emphasis on the triple bottom line: people, planet and profit would not only help them meet the various regulations imposed by the government but also would result in decreased inefficiencies and better market performance. Prominent researchers call this phenomenon as the law of the expected unexpected side benefits. Firms make different structural and infrastructural decisions to achieve sustainable performance. Our thesis work observes the managerial and policy level implications of such operational level decisions in some specific contexts.

In my first study, I look at the implications of introduction of a composite environmental regulation for an automobile manufacturer. Automakers world over are facing pressure from their stakeholders to follow sustainable business practices and produce products that are less harmful for the environment as well as the society at large. In this essay, I propose a composite regulatory standard that not just allows the regulators to control various environmental standards but also provides automakers an opportunity to exploit their investments in path dependent technologies. My results show that under a composite regulation even though the emerging market consumers may not value environmental quality, sufficiently high economies of scale will ensure higher traditional, environmental qualities as well as higher profits for the automaker when operating in two markets vis-a-vis a single market. I also find under the composite regulation that, when more demanding norms are in place, despite positive synergies between traditional and environmental quality attributes, higher environmental quality is not guaranteed unless the scale economies are su

ciently high. I also demonstrate the role of economies of scale and synergies in determining the choice of products made available to the customers by the automaker.

The objective of my second study is to understand the impact of environment and social sustainability related practices on the supply chain risk of the firm. Supply chain managers are finding it increasingly difficult to manage complex supply chains and have become more aware of the various risks that exist within and outside the firm. Anecdotal evidences all around the world suggest that firms face various environmental and social risks. However, extant literature has explored supply chain risk management and sustainability in isolation and has not explored the relationship between the both. I address this important issue and empirically test the relationship using data from the sixth edition of International Manufacturing Strategy Survey (IMSS). I find that sustainability efforts do have significant impact in reducing the supply chain risk. Also, in the presence of other risk mitigation efforts, sustainability efforts tend to reduce the overall supply chain risk. I also find differences in relationship between risk management, sustainability and supply chain risk in various geographic regions.

There is growing emphasis on making investments in responsible businesses with fair environmental and social practices, by shareholders across the world. Customer awareness pertaining to sustainable business practices of firms they are buying products from, is also on the rise. Apart from understanding what drives firms to invest in sustainable manufacturing practices, it is also necessary to look at the impact of these practices on firm performance. This work therefore attempts to study (i) whether the 'stakeholder pressure' and 'customer willingness to pay for sustainable products and processes' act as drivers for firm's environment and social sustainability efforts/practices, (ii) to what extent these sustainability practices lead to better sustainability performance and (iii) if indeed sustainability performance has any impact on quality and cost performance of the firm. I use data from the sixth edition of International Manufacturing Strategy Survey (IMSS) and structural equation modeling to test our conjectures, across emerging as well as developed markets such as India, China and OECD. My findings suggest that while customer willingness to pay has a significant impact on

sustainability efforts by firms across all the markets, stakeholder pressure has no impact in the Chinese market. I also found that, while sustainability performance in general has a positive impact on quality performance, it seems to result in cost savings surprisingly only in mature markets such as OECD countries.