Inclusive Innovation: Broader Market Coverage for Innovative Products with Deliberate Supply Chain Leadership

Vish Krishnan, Oleksiy Mnyshenko, Hyoduk Shin

Abstract:
New technological and product innovations, including some life-saving innovations, conventionally traverse a sequentially downward path of gradually lowering cost and prices which limits their availability to the lower-end of the market for a period of time. In this paper, we focus on the central question of how to achieve inclusive innovation or getting broader market coverage for new innovative products. We unearth a new degree of freedom in a multi-tiered supply chain that offers the ability for innovating firms to expand market coverage. Through an analytical model grounded in industrial practice, we show that deliberately choosing who in a multi-tiered supply chain invests in innovation and product development can have a significant impact on the market coverage of the product. Our model deals with products that have non-linear development and production costs and a product lifecycle which is characterized initially by product innovation being most dominant effect followed by a period of process innovation. We formalize the notion of a supply chain leader who is shown to invest the most and lead to the largest total supply chain profits (for a range of parameter settings). In addition, we are able to construct a sequence of deliberate leadership handovers such that during the product innovation stage, leadership is optimally shifted in an upstream direction from Tier 0 to Tier 1 and then to Tier 2 while during the process innovation stage, leadership should be shifted back downstream from Tier 2, to Tier 1, and then Tier 0 to optimize product quality and market coverage. Our results have important and subtle implications for firms launching innovative products and seeking to be more inclusive. Specifically, to obtain broader market coverage for its innovations, a downstream supply chain firm should initially drive investments in component innovation while gradually conferring a greater decision making role to its suppliers as the product development becomes easier and costs go down. Once the product is mature and the improvements are in reducing production costs, it makes sense for a downstream firm to take greater control of the decision making about innovation investments.