

# EVALUATING INVESTMENTS IN FLEXIBLE ON-DEMAND PRODUCTION CAPACITY – A REAL OPTIONS APPROACH

*Research Paper*

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## Abstract

*Ongoing digitalization of production accelerates trends like mass customization, ever shorter lead times, and shrinking product life cycles. Thereby, industrial companies face increasingly volatile demand that complicates an appropriate production capacity planning. On the other hand, the comprehensive digitalization of production environments favors, amongst others, the dynamic integration of flexible external on-demand production capacity provided by specialized external capacity providers (ECPs). To enable the usage of on-demand production capacity, industrial companies may require significant upfront investments (e.g., for inter-organizational information systems, planning and organizational processes, employee training). The objective of this paper is to develop a model that evaluates such enabling upfront investments from the perspective of a manufacturing company. To consider flexibility of action, we apply real options analysis in a discrete-time binomial tree model and weigh these so-called expansion options to related cash outflows. In addition, we evaluate our model by means of a simulation and sensitivity analyses and derive insights for both researchers and practitioners. The insights gained by our model present a profound economic basis for investment decisions on upfront investments in flexible on-demand production capacity.*

**Keywords:** *Investment Evaluation, On-demand Production Capacity, Volume Flexibility, Real Options Analysis, Expanded Net Present Value, Digitalization*