

Foreword

This doctoral dissertation deals with a very timely and important topic in the fields of international operations, finance and risk management, namely the evaluation of the Real Option value of operational and managerial flexibility within a global supply chain network. The author – who has worked for more than nine years on international supply chain strategy and design as an executive in world class automotive and high tech companies in the U.S. and in Europe – uses a large-scale data set from an existing global supply chain operated by a tier-one supplier in the global automotive industry in examining and comparing the following supply chain strategies: single sourcing, dual sourcing, compliance with local-content rules, centers of excellence and Real Options with flexibility in sourcing, production and distribution logistics.

The major finding of this empirical study is the identification of a Real Options strategy that results in a positive payback in less than a year and dominates all of the other supply chain strategies. The three main contributions of this work are: i) for the first time, a comprehensive and real data set is utilized to quantify and demonstrate the financial performance of various supply chain design strategies, ii) a new model of real price changes, i.e., which are driven by correlated exchange rate processes, is utilized and iii) ways for enhancing the Real Option values are suggested and an action plan is presented for the practical implementation of a Real Options strategy. Moreover, common supply chain practices or strategies in the industry are critically evaluated.

Overall, the dissertation is very well structured and written. Academics may focus more on the modeling issues whereas practitioners and executives may focus on the analysis of global business processes and the supply chain network design strategies. Several other features are also noteworthy: The application case is well chosen: i) in the world automotive industry, platform strategies lead to greater business opportunities with higher margin pressure, and ii) the trend towards further consolidation leads to the need for lean management and integration of the manufacturer's global supply chain networks. The literature review, which covers both operational and financial risk management issues, is quite comprehensive, current and well focused. The optimization model is among the largest of the ones referenced in the literature to date, and could be easily utilized in the analysis of a multi-period investment-planning problem.

The data set is recent and was utilized for actual business cases and investment decisions, and thus provides a good point of reference. The discussion on the use and implementation of a global supply chain strategy greatly benefits from the author's industry experience. The exchange rate model is somewhat novel, captures correlation effects and can easily be extended to a multi-period planning model. In particular, the selection process of a set of suppliers to construct an operational hedge is well specified, i.e., supplier development costs are traded off against the option value derived from enhanced supply flexibility.

The results are generated by making largely conservative (as opposed to optimistic) assumptions about the costs, parameters and risks of the underlying processes, i.e., changes in the nominal exchange rates. In addition, the sensitivity of the different supply chain strategies is examined in terms of their impact to changes in utilization rates and shifts in value added and material sourced respectively, between different trading blocs. Thus, exploitation of duty drawbacks and the impact of tariffs are well captured in this work, providing further evidence that Real Options can greatly enhance the performance of a globally operating firm while effectively reducing its downside risk exposure. Overall, the complex and difficult material is skillfully presented. Thus, this dissertation will, I believe, be recognized as a very valuable reference by senior executives, practitioners and academics in the fields of international operations, finance and risk management alike.

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