

CITY UNIVERSITY OF HONG KONG

香港城市大學

**VENDOR SELECTION
IN APPAREL SUPPLY CHAIN
CONSIDERING RISKS**

考慮風險準則的服裝供應鏈中供應商選擇

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Abstract

Over the past twenty years, the apparel supply chain is becoming more vulnerable to various risk factors, including economic crises, natural and manmade disasters, strikes, and political interruptions. This observation motivates supply chain managers to investigate the supply chain management in a more comprehensive framework. The present study is engaged in this tremendous surge by investigating the vendor selection problem considering risk as a critical criterion.

The abundance of available papers on both Supply Chain Risk Management (SCRM) and vendor selection individually has motivated us to realize the research gap for the current investigation. It also suggests that there is little awareness of the issue in the apparel industry. By combining the two topics, we are able to investigate the possibilities for creating a model that will allow the members of the industry correctly assess the vendors as well as manage the risks associated with vendor selection.

Firstly, this thesis will observe the current situation in the apparel industry based on industrial interview and case study. In order to identify appropriate criteria for the implementation of vendor selection, we focused on an empirical study of Hong Kong Apparel Society Limited, SAC (Sustainable Apparel Coalition), Better Buying, SFBC (Sustainable Fashion Business Consortium), which provides a great baseline for the industry. The empirical study was designed in a form of questionnaire which was made available to the members of the abovementioned organizations.

As a result of the study, we managed to identify such criteria in vendor selection as finance, quality, delivery service, flexibility, partnership, and risk. Pair-wise comparison

results among these criteria have been collected from the survey participants. Based on the rationale of reducing the inconsistency between criteria comparisons, a subjective approach is developed to decide on the exact weights associated with each evaluated criterion.

Secondly, this thesis alternatively proposes several objective weights determination methods for the multiple criteria vendor selection problem, including minimizing the overall deviation from the ideal point, minimizing the mean absolute deviation, and group decision making. Then a consensus model is provided to minimize the weighted least square of the discrepancies among different decision makers.

Thirdly, considering that the measurements of some criteria for the vendor selection problem are uncertain, this thesis formulates an interval decision matrix to describe such a situation, which could be regarded as a stochastic optimization problem. For the purpose of facilitating vendor selection under these conditions, this thesis applies a powerful tool in the domain of decision analysis, namely, Stochastic Multicriteria Acceptability Analysis (SMAA-2), for realizing the effective vendor selection.

Most importantly, this thesis serves the purpose of informing the concerned members of the industry, which in turn shall encourage future research on the subject. Since the matter of vendor selection in apparel supply chain is currently not deeply investigated, we are hoping that this thesis will serve as a first step for future investigations and researches.