

國立政治大學研究所碩士論文摘要

研究所別：資訊管理研究所

論文名稱：具可靠度及穩健考量的新產品全球運籌模式之探討

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關鍵詞：全球運籌、新產品、混合整數線性規劃、穩健規劃、可靠度

論文內容摘要

在全球化的環境下推出新產品，企業除了面臨隨著產品生命週期改變的顧客需求以及成本上的不確定因素外，同時還必須考量全球營運帶來的種種挑戰。

許多供應鏈管理數量模式相關文獻針對全球運籌、新產品供應鏈等議題多有所探討，利用數量模式的計算以反應真實世界中的種種不確定性，讓管理者在供應鏈策略規劃時有所依據，但卻少有同時探討全球運籌以及新產品供應鏈的相關文獻。學者 Butler, Ammons, and Sokol 認為過去新產品供應鏈模式忽略了新產品將有可能無法存活下來的情形，因此發展一套新產品供應鏈模式，使新產品供應鏈能夠順利從上市成長到成熟階段，並利用此模式決定新設施、新機器購入的時機。

本研究延伸 Butler 等人之新產品供應鏈模式，考量更完整之全球運籌相關議題，透過混合整數線性規劃描述新產品發展時全球運籌配置問題，並利用情境為基礎的穩健最佳化以取得低風險的供應鏈配置，此外加入可靠度的影響，以彌補供應鏈規劃與實際操作的差距，並加入缺貨之懲罰成本，最後以範例資料進行計算與分析此數量模式，經由模式計算結果發現本研究規劃之結果，相較於原 Butler 等人之模式有較低的缺貨的發生可能性，且所求得之配置整體可靠度皆有所提升。

本研究所提出之規劃與分析方法可提供決策者在進行新產品全球佈局規劃時，能當作其新產品運籌配置之決策參考。

Title of Thesis : A Reliable and Robust Model for Global Logistic Systems in New Product Development

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Degree Conferred : MBA

Abstract :

When putting out new products under the environment of globalization, enterprise not only faces the uncertain factors in the demand of the customers and the costs that change with product life cycles, but considers all sorts of challenges which come with global operation.

Many researches into supply chain quantitative model that probe into global logistics and the new product supply chain employ the quantitative model to reflect all sorts of uncertainty in the real world. They provide managers with the basis for the supply chain strategy and management. But few researches discuss about the global logistics and the new product supply chain simultaneously. Bulter, Ammons, and Sokol argue that the model of new product supply chain of the past neglects the condition which new products may not survive. Thus they developed a new product supply chain model to enable new products to launch the market and grow to maturity as well as decide when to purchase new supply chain facilities and equipments.

This research which extends the new product supply chain model of Bulter et al. considers issues on global logistics from a more integrated view. First of all, it solves the global logistic settings problem in new product development by means of mixed-integer linear programming. Secondly, it uses the scenario-based robust optimization to lower the risk in the supply chain design. Then it adds the reliability calculation to make up for the gap between the plan and the real operation. At last it calculates and analyzes the quantitative model on the basis of the case data. This research establishes a methodology for decision makers to apply to plan and analyzing their new product supply chain when they make the global arrangement of new products.

Key words: Global Logistics, New Product, Mixed Integer Linear Program,
Robust Optimization, Reliability.