納入季節效應之擴散模型於主機板銷售之預測分析

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摘要

本研究納入季節性要素於擴散模型闡述高科技產品的演化動態,主機板之營運第三季與第四季營業額較大,若模型 不考量主機板季節影響要素,預測結果會有所偏誤,故本研究首度納入季節要素,調整 Bass 擴散模型的預測值,比較傳統 模型與季節調整的模型,何者預測能力較佳。本文第一個研究目的是比較考量季節週期的模型與傳統模型預測高科技產品出 貨量的精確性,測試納入季節性要素的模型是否較為準確。本文的第二個研究目的分別按照主機板的生產區位區分為中國、 台灣與其他地區,比較何地區的營業績效較受到季節性因素的影響,本文的第三個研究目的是以經營模式作區分,比較專業 代工與自有品牌的營業績效,何者受到季節性要素影響較大。本文發現主機板生產會漸由初期的台灣主導移轉至中國,中國 主機板市場潛量高達台灣主機板市場的二十倍之多。接著我們發現專業代工的市場潛量遠大於自有品牌,隱含電腦產品零組 件標準化,能促使專業分工發揮規模經濟。主機板出貨有極明顯的季節效果,歐美消費者九月開學時會大量添購電腦,年底 會購買電腦作為聖誕賀禮,第三、四季主機板出貨量較其他季節為高,故本研究證實納入季節因素的擴散模型預測誤差較傳 統擴散模型為低,預測能力較佳。

關鍵字:季節性要素,主機板, Bass 擴散模型,預測值

Application of Diffusion Model Incorporating the Seasonal Effect in Predicting Motherboard Sales

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Abstract

The first purpose of this study is to incorporate the seasonal effects in a diffusion model to compare the differences in sales diffusion between two business strategies, own brand manufacturing and original equipment/design manufacturing strategies. This study examines whether the sale volumes of the third and fourth quarter are greater than those of the other quarters. Our evidence is expected to highlight the fact that European and American customers purchase computers as Christmas gifts. The second purpose of this study is to incorporate the seasonal effects in a Bass model to discuss the diffusion process of the sales in the two main worldwide production regions of motherboard industry, Taiwan and China. Finally, this study conducts the prediction accuracy analysis and examines whether our proposed diffusion model, which takes seasonal factors into account, is superior to the conventional diffusion model. Regarding diffusion process of different business model, we find that the potential market of original equipment/design manufacturing strategy is by far greater than that of own brand manufacturing strategy. This implies that the manufacturing of motherboards is characterized by standardization and high compatibility of components, allowing original equipment/design manufacturing enterprises to dominate the market of motherboards by taking advantage of their economy of scale. Generally speaking, the sale volumes of the third and fourth quarter are greater than those of the other quarters. The possible reason is the fact that European and American customers purchase computers as Christmas gifts. In addition, when a new school semester begins, students buy computers surrounding September. Finally, this study proves the prediction accuracy of our proposed diffusion model to be superior to the conventional diffusion model when taking seasonal factors into account. Our results can provide motherboard manufacturers with a valuable insight into motherboard diffusion characteristics to help them review their business strategies.

Key words: seasonal effect; motherboard, Bass diffusion model, prediction accuracy