

列車站間差別訂價與折扣模式之應用 - 以台灣高鐵為例

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摘要

新運具票價規劃的良窳，會直接影響營運者的營運收益以及市場需求的擴張機會；差別訂價為運輸產業常見的訂價方法之一，主要是營運者透過區隔旅運需求市場，從旅運者身上剝削更多消費者剩餘，以創造更高的營運收益。在過去文獻中，時間差別訂價研究繁多，然而旅運者因尖離峰差別訂價而轉換旅運需求的行為有限，再加上執行尖離峰差別訂價需具備場站設備高度的營運調度彈性，這使得最後營運量及收益創造的效果往往有限。

本研究以高鐵為例，藉由建立高鐵不同起迄站間的市場需求函數，透過各站間旅運者對票價折扣的敏感性不同，以站間差別訂價法的方式以及折扣模式，搭配基因演算法，求解短期營運條件固定下，營運者的最大化營收目標。並期望透過基因演算法，有效調整新運具在進入市場初期，供需價量尚未定平衡時，營運資源出現閒置利用或供不應求的結果。系統運行結果，包括各起迄站間最適折扣票價、需求量、以及最大營運收益目標等，在與未執行站間差別訂價法的營運狀況比較後，驗證站間差別訂價法與求解模式確實帶來執行的效益，並可提供營運者未來營運規劃參考方向。

關鍵字詞：高?、旅運需求、基因演算法、站間差別訂價



An Origin-Destination Fare Differentiation and Discount Model by Example of Taiwan High-Speed Rail

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ABSTRACT

It is important to a new transportation to design pricing strategies well for driving revenue and market expansion. Price discrimination is common in the transportation and communication industry. Because there is a different price elasticity of demand form each group of passengers and the operator can prevent market seepage or consumer switching, the operator can increase its total revenue and profits by adopting such a strategy.

Peak and off-peak fare is an application in the Price discrimination. It has been very carefully researched in the past. Some studies accused its effect of increasing operation revenue and expanding market demand, because they have confirmed the strategy is hard to cause passengers to change their departure time or arrival time. Therefore, the study would like to use Taiwan high-speed rail (THSR) to be a case and define a new fare strategy to better utilize the operation resources and gain the maximum revenue.

The study develops an origin-destination fare discrimination model and a heuristic algorithm (Genetic Algorithm, GA) has been applied. Operator can use the fare discrimination method to get maximum revenue, but should be restricted by existing operation resources and the price sensitivity of demand for THSR passengers coming from different origin-destination group. Under this model, it presents the results of the integrated model of service planning and pricing method. The optimal availability of seat, the optimal fare, and the maximum revenue would be find by the integrated model. The case study shows reasonable and promising results for the flexibility and capability of the integrated model of service planning and pricing method.

Keywords: Taiwan High-Speed Rail, Travel Demand, Price Discrimination, Genetic Algorithm