

A priority mix planning model for semiconductor fabrication under an  
uncertain information environment

李欣怡, Tsun-Hung Huang, He-Yau Kang

Industrial Engineering and System Management

Management

amylee@chu.edu.tw

Abstract

The prosperous days in semiconductor manufacturing have long been gone due to a cut-throat competition. In order to survive, a semiconductor manufacturing company not only must stress on customer satisfaction to acquire and to maintain market share, it also needs to achieve the profitability goal at the same time. In addition, a semiconductor fab is highly capital intensive, and a good utilization of the existing assets is essential. In consequence, the production planning in an environment with multi-product types and multi-priority orders must be prepared carefully. The performance evaluation of different priority mixes is a multiple criteria decision making problem that may consider criteria such as manufacturing of products, deployment of equipment efficiency and profitability of a fab. The importance of each criterion however is inherently difficult to be precisely determined by a decision maker. The main objective in this study therefore is to construct an analytical approach under a fuzzy environment, and a fuzzy analytic hierarchy process (FAHP) model that applies fuzzy set theory and entropy weight concept is utilized to deal with uncertainty. A performance ranking of priority mixes can be generated, and the results provide guidance to a fab regarding strategies for accepting orders.

Keyword : Semiconductor, Multi-product, Multi-priority, Performance, FAHP