

COMPETITIVENESS OF HIGH-TECH MANUFACTURING INDUSTRY: AN EMPIRICAL ANALYSIS OF SEMICONDUCTOR COMPANIES IN EAST ASIA

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Abstract

The impact of intensifying competition within domestic and international markets is continuously being felt across varied industries, thus prompting companies to develop capacity to make effective competitiveness enhancement strategies in order to maintain sustainable growth. Looking at the high-tech industry – specifically the semiconductor industry (SI) – though this realization is evident, there still lacks exhaustive consensus as to what factors should encompass an effective competitiveness enhancement strategy. As such, this study set out to investigate and provide an understanding on the critical factors that drive the competitiveness of East Asia's SI. An empirical study was conducted on 6 semiconductor companies drawn from the primary semiconductor manufacturing countries and regions i.e. Japan, China, South Korea, Taiwan, U.S. and Europe. In order to provide a holistic understanding of the companies' competitiveness, a multi-theory framework for analyzing industrial competitiveness was applied. This encompassed a combined outlook on competitiveness indicators and competitiveness drivers. An analysis of competitiveness indicators was aimed at identifying the different competitiveness levels of the companies through analyzing their financial and non-financial performance dimensions. This was done using data extracted from their respective financial statements and annual reports. Through this analysis, it was deduced that all companies under study were performing optimally. On the other hand, an analysis of the competitiveness drivers

aimed at analyzing the internal performance drivers of the companies, involved a combination of the resource based view theory (RBV) and the operations management based (OM-based) factors. The data used to conduct this analysis was collected from 26 managers of semiconductor companies through a questionnaire survey. Data obtained was then analyzed using the analytical hierarchy process (AHP) technique, through which a pairwise comparison of various decision criteria and decision alternatives was conducted in order to determine, with different weights, how the managers prioritize them towards enhancing competitiveness of their respective companies. Through this analysis, it was deduced that, for semiconductor companies in East Asia, decision criteria related to *Quality*, *Cost* and *Flexibility* were of utmost importance for the company when formulating competitiveness enhancement strategies. When poised with various decision alternatives to focus on with respect to specific decision criteria, the findings of this study deduced that for semiconductor companies in East Asia: (i) with respect to *Quality* criteria, the factors that drive competitiveness include; the capacity to enhance their *product performance*, maintain *low defect rate* and enhance *reliability* (ii) with respect to *Cost* criteria, these factors include; the capacity to implement *continuous improvement* projects, maintain and control *quality cost* and *production cost* and (iii) with respect to *Flexibility* criteria, these factors included; having a *broad product line* and having the capacity to influence a *change in product mix*. It is the hope of the author that the findings of this study will help managers of semiconductor companies to formulate effective competitiveness enhancement strategies by incorporating those decision criteria and decision alternatives that have been identified as important to them as well as by drawing from those drivers that are unique to the most competitive companies in this industry. These findings are also expected to provide an ideal platform for researchers conducting studies on competitiveness of semiconductor companies.