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Journal of High Technology Management Research 17 (2006) 71–83
THE JOURNAL OF HIGH TECHNOLOGY MANAGEMENT RESEARCH

Industrial competitiveness analysis: Using the analytic hierarchy process

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Available online 19 June 2006

Abstract

Industrial competitiveness is an important issue for countries pursuing export-oriented industrialization policies. Assessing the competitiveness of an industry is a complex process and it can be analyzed from several perspectives. This paper proposes that the aggregate performance of many firms in a particular industry can reflect the competitiveness of that industry as a whole. Based on theories from strategic management and operations management research, it presents an AHP-based model to comprehensively explore the varying degrees of importance of the indicators and drivers of industrial competitiveness. The model helps to identify the degree to which organizational performance indicators are important when assessing industrial competitiveness. Further, it helps to evaluate the importance of particular factors that drive firms to perform better. The paper presents an application of this model by applying it to the automotive components industry in Thailand.

Keywords: Competitiveness; Analytic hierarchy process; Automotive industry

1. Introduction

Intense competition in international markets requires firms to improve competitiveness. These improvements not only benefit the firms themselves, but also have a direct impact on the competitiveness of an industry as a whole. The competitiveness of the firms within a particular industry therefore, reflects the competitiveness of that industry. However, there is still debate among several disciplines regarding how the competitiveness of these firms should be measured and what factors affect competitive performance. These divergent perspectives suggest an alternative approach that would apply multiple theories to analyze competitiveness in order to better appreciate its complexity (Coates & McDermott, 2002; Hoskisson, Hitt, Wan, & Yiu, 1999).

Although conventional approaches to competitiveness tend to be limited in scope, this study takes a more comprehensive approach. It considers how the competitiveness of many firms can signify the competitiveness of an overall industry by proposing an analytical model that applies theories rooted in both strategic management and

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1047-8310/$ - see front matter © 2006 Elsevier Inc. All rights reserved.
doi:10.1016/j.hitech.2006.05.005

operations management to study the complex relationship between factors that affect industrial competitiveness. The strategic management school tends to measure competitiveness mainly from the firm's financial performance. The factors that drive performance are explained according to the industrial organization (IO) or the resource-based view of the firm (RBV). On the other hand, the operations management (OM) school suggests that competitiveness indicators should encompass multiple aspects of organizational performance, by considering manufacturing functions as competitiveness drivers. The analytic hierarchy process (AHP) is proposed as an ideal analytical tool to develop a generic model of industrial competitiveness that comprises theories from two different management points of view and takes best advantage of each theory's particular strengths. The model shows how both strategic and operations management theories can be used to explain the complex relationship between competitiveness indicators and drivers. This approach offers a deeper understanding of competitiveness because it helps to identify the degree to which a specific performance indicator is important to the firms within an industry and how it reflects the competitiveness of that particular industry. In addition, it helps evaluate the extent to which each driver affects the indicators. Therefore, this model can be used to solve practical problems that arise when devising strategies to improve competitiveness.

To illustrate the potential benefits of this model, this study applies it to the analysis of the automotive components industry in Thailand. This particular industry is selected as a case example for several reasons. First, automotive parts makers in developing countries are struggling in the global arena. Second, the industry is a good representative example of the manufacturing sector since it demonstrates substantial degrees of complexity both in terms of production and competition in the global market. The automotive sector has also become increasingly important to the Thai economy. In 2003, the Thai government launched a campaign to develop this sector into 'the Detroit of Asia'. Two years later (2005) this sector generated about 10% of the total exports of industrial goods and employed more than 250,000 people. Results obtained from the model proposed in this study therefore, should be useful to automotive parts makers as well as to policy makers who must devise sound competitiveness improvement strategies.

2. Industrial competitiveness analysis

Since it is the individual firm that produces goods and competes in the global market, an analysis of industrial competitiveness should take into account the involvement of firms' collective performance. This section reviews the literature to identify the specific indicators and drivers of competitiveness that are pertinent to the manufacturing sector.

2.1. Competitiveness indicators

Although financial indicators such as return on investment and return on assets are the conventional proxies of competitiveness, several non-financial performance indicators are also important. Non-financial performance indicators that are widely used include overall customer satisfaction (Sharma & Fisher, 1997; Tracey, Vonderembse, & Lim, 1999); market share (Anderson & Sohal, 1999; Li, 2000; Sharma & Fisher, 1997); market share growth (Tracey et al., 1999); overall competitiveness (Anderson & Sohal, 1999; Lau, 2002); sales volume (Anderson & Sohal, 1999; Li, 2000); sales growth (Lau, 2002; Sharma & Fisher, 1997); overall plant success (Gordon & Sohal, 2001); and productivity (Noble, 1997; Ross, 2002; Sharma & Fisher, 1997).

The use of both financial and non-financial performance indicators creates a more accurate performance measurement system because it offers a more complete view of a business and can therefore lead to better-informed business decisions (Kaplan & Norton, 1992; McAdam & Bailie, 2002; Neely, Filippini, Forza, Vinelli, & Hii, 2001; Nilsson & Kald, 2002). This performance measurement system is a useful strategic tool for manufacturing firms (Chenhall, 2005; De Toni, Nassimbeni, & Tonchia, 1997) because it gives them a more detailed analysis of organizational performance, which can in turn, lead to a more meaningful analysis of industrial competitiveness.

2.2. Competitiveness drivers

Two strategic management theories — the IO and RBV — can explain why firms achieve different degrees of financial performance (Hoskisson et al., 1999). The latest development of the IO theory by Porter