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Quality management practices and competitive performance: Empirical evidence from Japanese manufacturing companies

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ABSTRACT

This paper presents the results of an empirical study on the relationship between quality management practices and competitive performance in Japanese manufacturing companies. The data was gathered from two surveys including the common sample of twenty-seven Japanese manufacturing companies in the 1990s and the 2000s. Statistical techniques are used to compare the degree of implementation of the eleven quality management practices and their impact on different dimensions of competitive performance between two periods. Findings of this study highlight the stability and consistency of the Japanese quality management, which can be used as one of the strategic weapons for maintaining competitive advantage of Japanese manufacturing companies.

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1. Introduction

During the 1990s, the Japanese economy has suffered from a long recession. The growth rate has markedly declined. Many companies have suffered from low profits or financial losses. However, some well-managed Japanese manufacturing companies still continue to hold their strong competitive power in the global market. The survival and prosperity of Japanese manufacturers are achieved by their Japanese way of management such as total quality management (TQM), just-in-time (JIT) production, total productive maintenance (TPM), and concurrent engineering, and their ability to create horizontal linkage structure throughout the communication network. Those are real strengths of Japanese manufacturers, besides of their technological advantages as demonstrated by Morita et al. (2001) and Matsui (2002a). Quality management has been recognized as single most critical success factor in Japan's manufacturing (Imai, 1986; Ohno, 1988). Quality management in Japan is characterized as company-wide participation, emphasis on employees training, quality circles, quality diagnoses, statistical methods, and national-wide campaign. People from all levels of management and workers are involved in the company-wide quality management or total quality management (Schroeder and Flynn, 2001; Matsui, 2002b; Schonberger, 1986, 2007). This concept intends to not only control quality levels of products by applying statistical methods and other analytical techniques, but also manage all kinds of work properly centered

on quality. While the emergent trends in Japanese management are studied and presented in several academic papers and articles regarding manufacturing strategy (Fujimoto, 2004), business restructuring by vertical and horizontal alliances (Kono and Clegg, 2001), supplier involvement in product development (Takeishi, 2001), and transforming individual skills to organizational capability (Sako, 1999), there is a little evidence on how Japanese quality management is longitudinally maintained for enhancing the efficiency and effectiveness of manufacturing companies which are coping with fierce competition from other developed countries or emergent economies. In order to address this need, this paper presents results of an empirical study on the relationship of quality management practices and competitive performance in Japanese manufacturing companies. This objective is accomplished by analyzing a set of data gathered from two surveys, which includes the common sample of twenty-seven Japanese manufacturing companies conducted in 1993–1994 and 2003–2004. Eleven measurement scales are utilized to measure different aspect of quality management. Findings of this study highlight the robustness, stability, and consistency of Japanese quality management and its positive relationship to the competitive performance in manufacturing plants. This study provides empirical evidence that Japanese manufacturing companies explore quality managements as a strategic weapon for improving competitive advance during the 1990s and the 2000s. The remaining of this paper presents the analytical research framework, which is followed by description of data collection, measurement testing, and hypothesis testing. The last three sections discuss the important findings, limitations, and final conclusions.

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2. Analytical framework

The evidence of outstanding performance of Japanese manufacturers in the late 1970s and the 1980s led to the development of world-class manufacturing (WCM) and high performance manufacturing (HPM) perspectives (Hayes and Wheelwright, 1984; Schroeder and Flynn, 2001). These perspectives suggest that the ability to develop simultaneously different competitive advantages is achieved through development of an infrastructure of practices focused on designing, controlling, and continuously improving processes to produce high-quality product. Excellent quality is regarded as a platform for achieving other competitive edges such as cost, delivery, cycle time, and flexibility. For successful implementation of quality management, several daily practices should be conducted in manufacturing plants such as process management, customer focus, supply quality involvement, and small group activity (Flynn et al., 1995). Characteristics of Japanese quality management have been analyzed in several empirical studies. Matsui (2002b), using survey data from forty-six manufacturing plants in the 1990s, found the similarity in quality management practices among machinery, electrical & electronics, and automobile in Japan and significant contribution of customer involvement, cleanliness and organization, and supplier quality involvement on performance indicators such as fast delivery, inventory turnover, and cycle time. Schroeder and Flynn (2001) comparatively studied quality practices in 164 plants located in the United States, Japan, Germany, Italy, and United Kingdom during the 1990s and found that Japanese manufacturers took advantage of quality management over other countries in terms of shop floor activities such as process control, information feedback, and small group activities. It was also detected that US plants more emphasized on customer satisfaction and relationship than Japanese plants. To continue the previous studies of Schroeder and Flynn (2001) and Matsui (2002b), this paper empirically analyzes the relationship between quality management and competitive performance based on the relevant measurement scales and data collected from Japanese manufacturing plants through extensive questionnaires. The aims of this study is to identify the stability of Japanese quality management between the 1990s and the 2000s and to examine

whether Japanese quality management significantly impacted on the competitive performance in manufacturing plants in the new context of manufacturing environment at the beginning of the 21st century.

The framework of this study is presented in Fig. 1. The first component of our simple analytical framework is Japanese quality management that represents company-wide activities to improve the quality level of products and works through customer orientation, continuous quality improvement, and employee involvement to establish and sustain competitive advantage. The second component includes the different aspects of competitive performance of manufacturing plants: quality, cost, delivery, and flexibility. As observed by consumers and researchers, Japanese manufacturers are routinely producing extreme high-quality products at very low cost with short production cycle time and new product development time. Thanks to the foolproof process and utilization of statistical process control, the variation of process is identified and eliminated. Minimization of process variance results in a reduction of scraps and reworks; thus, reduce the production cost. The reduction of defected product also leads to a reduction of time delay for rework, inspection, and time for machine stop. These allow the production run faster with shorter consuming time from material receiving to customer delivery. High conformance quality product, short cycle time, and multi-skill workers allow the plant having abilities to change volume mix and product mix. In summary, high product quality is associated with the low cost, on-time delivery, and high flexibility. Then, we would like to propose the hypotheses on the consistency and stability of quality management in Japanese plants and its contribution to competitive performance as described as follows.

Firstly, it is expected that Japanese manufacturing companies share the similar characteristic and structure of their quality management. Quality management movement was raised in Japan during the 1950s with high commitment of top management leadership to quality, quality-based strategy development, strong focus on human resource management, process management, and customer and supplier relationships. Between the 1990s and the 2000s, as mentioned in the cited literature, Japanese manufacturers made a lot of efforts on restructuring

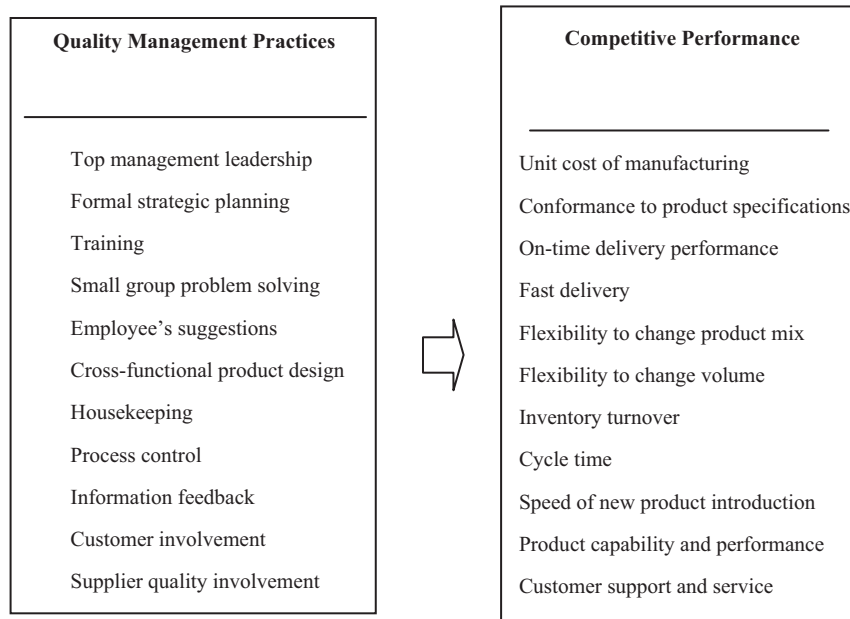


Fig. 1. Framework of study on Japanese quality management.

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