

Meta-analysis of the relationship between quality management practices and firm performance—implications for quality management theory development

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Abstract

Quality management (QM) has received a high degree of attention in extant literature. Several research papers attribute superior firm performance to adoption of QM practices. The availability of a large number of research papers that investigate the impact of QM practices on performance provide an ideal setting for theory extension and refinement using meta-analysis techniques. In this paper a meta-analytic study is presented that fulfills two objectives. First, the paper formalizes performance implications of adopting QM practices and present hypothesized relationship between QM practices and performance. Second, a meta-analysis of correlation (Hunter and Schmidt, 1990) approach is used to examine the empirical research in QM to determine which QM practices are positively related to improved performance. The study also examines the presence of moderating factors in the association between QM practices and performance. The results support many hypothesized relationships and also point towards the presence of moderating factors in almost all QM practice–performance relationships. A discussion of the findings is presented and directions for further development of QM theory are proposed.

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1. Introduction

Quality management (QM) represents one of the most significant research themes in operations management. Dean and Bowen (1994) highlight the increased level of interest in QM in many sectors of economy such as manufacturing, service, health care, education, and government. Today QM is a widely accepted organizational goal for several companies. While in the late 1980s and early 1990s several quality management initiatives such as “Total Quality Management” carried a faddish element with it, it is now widely believed that

the underlying practices in QM are fundamental and essential for effective management and competitive survival of organizations. Theory development in this sphere of organizational practice is important and has consequences for both academic researchers and practitioners. Thus, a close examination of the research findings associated with QM is critical for furthering knowledge in this area. This meta-analytic study is an effort in this direction to gain further insights into the performance implications of QM practices.

Although QM has only emerged in the management literature over the past 15 years, antecedents of the movement have been in existence for much longer (McAdam and Henderson, 2004). With the tremendous growth of literature in both academic and practitioner-oriented outlets, the term QM has been diluted to mean

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different things and the scope of activities underlying QM lack consensus (Watson and Korukonda, 1995). Yet, over time in the academic literature the term has gained consistency in its meaning. Hackman and Wageman (1995) highlight the strong evidence of convergent and discriminant validity of quality management construct as proposed by its founders. In a recent paper, commenting on the validity of quality management, Sousa and Voss (2002, p. 106) conclude that, “QM as espoused by its founders, can be reliably distinguished from other strategies for organizational improvement and there is substantial agreement in the literature as to which practices fall under the QM umbrella”. The paper provides an excellent account of the present state of quality management research and an agenda for future research. The authors suggest that (p. 94), “the agreement in the literature on what constitutes QM indicates that QM as a field has indeed matured and is laid down on solid definitional foundations”, and assert that while the definitional issues are more or less resolved, there is still a need to “incrementally build on the already existing base” (Sousa and Voss, 2002, p. 94). A meta-analysis of the findings in extant literature can provide impetus to the incremental theory development activity in QM. This meta-analytic study critically and quantitatively examines the literature and evaluates the performance implications of QM practices.

The early stages of empirical research in QM created instruments capable of measuring QM practices and performance constructs (Saraph et al., 1989; Flynn et al., 1994; Ahire et al., 1996). These constructs are present in the frameworks used for the national quality awards, such as the Malcolm Baldrige National Quality Award in the US and the European Quality Award (Sousa and Voss, 2002). Using these constructs, several research studies have examined the link between QM practices and performance. Scholars have investigated both direct and indirect effects of QM practices on performance. A large body of literature highlights the positive implications of QM practices on performance (see for example, Flynn et al., 1995; Anderson et al., 1995; Choi and Eboch, 1998; Das et al., 2000; Ahire and Dreyfus, 2000; Cua et al., 2001; Douglas and Judge, 2001; Ho et al., 2001; Kaynak, 2003; Shah and Ward, 2003). Mohrman et al. (1995) found that 83% of the surveyed companies had a “positive or very positive” experience with QM, and 79% planned to “increase or greatly increase” their QM initiatives in the next 3 years. Meanwhile, studies also find evidence pointing towards mixed performance implications accrued from QM practices. For example, Dow et al.

(1999) find that employee commitment, shared vision, and customer focus practices are positively related to performance but “hard” practices such as benchmarking, cellular work teams, advanced manufacturing technologies, and close supplier relations do not positively contribute to improved performance.

Studies have also highlighted the failure of QM implementations in delivering the desired performance benefits. Some of these studies reported estimates of QM failure rates as high as 60–67% (Dooyoung et al., 1998). Fredrickson (1984) found that comprehensive decision-making in QM was negatively related to performance in the highly unstable forest product industry. Researchers have concluded that rational comprehensive quality data analysis and information processing is of limited use or even counterproductive under conditions in which multiple problem definitions are possible, goals are ambiguous, or uncertainty is great (Daft and Lengel, 1986; Daft et al., 1988; Lord and Maher, 1990; March and Olsen, 1976). Dean and Bowen (1994) state that, “as total quality management moves from the buffered technical core of manufacturing toward use in research, marketing, and customer service activities, such conditions are more likely”.

These mixed findings and the need to gain further insights into generalized QM practices-performance link provide motivation for this replication study. Several research articles have explicated the importance of replication and its role in the conduct of scientific inquiry (Bornstein, 1990; Brown Gaulden, 1982; Greenwald, 1975; Leone and Schultz, 1980; Lykken, 1968; Madden et al., 1979; Mahoney, 1987; Mittelstaedt and Zorn, 1984; Monroe, 1991, 1992; Neuliep and Crandall, 1990; Reid et al., 1981). Replication research plays an important role in external validation of cause-and-effect relationships (Cook Campbell, 1979). Hubbard and Vetter (1996) state that replication research aids in ensuring the integrity of a discipline’s empirical results and in contributing to the growth of knowledge by guarding against Type I errors (erroneous rejections of the null hypothesis) and other questionable findings and by assessing the robustness and empirical generalizability of results. Easley et al. (2000) assert, “If the goal of science is to produce universal truths, inherent to this goal is the task of adequate theory development and refinement, in which the criterion of reproducibility should be inextricably intertwined”.

In line with the underlying objective of a replication study, this paper uses meta-analysis technique to aid development and refinement of QM theory. Meta-analysis attempts to establish the reproducibility of results by synthesizing and integrating existing findings

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