



Contents lists available at ScienceDirect

## Journal of Operations Management

journal homepage: [www.elsevier.com/locate/jom](http://www.elsevier.com/locate/jom)

## ISO 9000/1994, ISO 9001/2000 and TQM: The performance debate revisited

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### ARTICLE INFO

#### Article history:

Received 13 December 2006  
Received in revised form 2 April 2009  
Accepted 10 April 2009  
Available online 22 April 2009

#### Keywords:

Quality management  
ISO 9000  
TQM  
Postal survey

### ABSTRACT

The debate about the impact of ISO 9000/1994 on performance has been waging since its inception. While there is a general agreement regarding the positive impact of TQM on performance, there has been less agreement among the academics about the impact of ISO 9000/1994. Perhaps in response to such debate, the new ISO 9001/2000 has appeared purporting to be more in line with the TQM philosophy. As of now, how this 2000 version actually affects performance is yet to be explored. In this study, we compare the implementation of ISO 9000/1994 and ISO 9001/2000 as representing two different efforts to implement quality management practices. We evaluate its impact on company performance with a sample of 713 Spanish industrial companies. We also examine if the 2000 version of ISO is taking us closer to the implementation of TQM. Further, we depart from the past studies methodologically by considering performance as a formative construct rather than a reflective construct. Based on the mean and covariance structural (MACS) analyses, we conclude that ISO 9001/2000 certified companies do not perform noticeably better than ISO 9000/1994 or non-certified companies. However, we find that ISO 9001/2000 certified companies apply TQM at a higher level than ISO 9000/1994 certified companies, but whether they actually perform better is less clear.

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## 1. Introduction

ISO 9000 series of standards first emerged in 1987 as the torch-bearer of the standards for doing business in Europe. According to the International Organization for Standardization (ISO), at the end of 2006 there were 897,866 certified companies in the world ([www.iso.org](http://www.iso.org)).

With a growing annual rate of 20% for the period, 1995–2006, the number of ISO certified companies has been growing at a rate far higher than the economic growth. The academia has certainly taken notice of this phenomenon. As of late 2008, the ABI/INFORM database alone contains 2484 references that include ISO 9000 in their title or abstract. The bulk of these papers address managerial issues surrounding the ISO standard and its effects on company performance.

The *Journal of Operations Management* has published three seminal articles on the impact of ISO 9000 on company performance. The first paper appeared in 1997 (Terziovski et al., 1997) as one of the more rigorous studies analyzing this subject. In this paper, Terziovski et al. found that ISO 9000 had little or no impact on company

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performance. The authors used TQM as a moderating factor for the ISO–performance relationship. The second paper came in 2005 (Naveh and Marcus, 2005) addressing the same issue. They first reported ongoing debate regarding the effects of ISO standards on company performance. They then concluded that the way a company implements the standard is what introduces variations that distinguish one company from others in operating performance. The better a company uses the standard in daily practice and as a catalyst for change, the greater the operating performance from ISO implementation. The third paper is authored by Benner and Veloso (2008). They again highlight the existing debate between ISO 9000 and firm performance. They proposed a possible explanation for the previous contrasting results by differentiating the early adopters from late adopters. Financial performance advantages enjoyed by early adopters can disappear for the late adopters as more firms adopt and achieve similar generic improvements.

Clearly, the three articles have shed light on the question of the ISO's impact on company performance. However, all of them were built on the 1994 version of the standard. The study by Terziovski et al. (1997) appeared long before the 2000 version was instituted. Also, looking at the year of first submission (2002), the study by Naveh and Marcus (2005) also used data collected under the old ISO standards. The third and very recent paper (Benner and Veloso, 2008) uses data from 1988 to 1997. Presently, no more certification is being offered under the old version, ISO 9000/1994; the newest version of the ISO standard, ISO 9001/2000 (approved in December 2000) has now become compulsory for all applicants since the end of 2003.

A key departure reflected in the new ISO standard is a more extensive incorporation of TQM philosophy. Previously, ISO had been criticized for being incomplete in how it incorporated TQM practices into its requirements (Gotzamani and Tsiotras, 2001; Lee et al., 1999; Reimann and Hertz, 1996; Zhu and Scheuermann, 1999). The 2000 version is purported to be much more complete in its treatment of TQM; for instance, Biazzo and Bernardi (2003) observed that the changes that underlie the 2000 version have a much closer association with TQM principles compared to the 1994 version.

The main objective of this research is to extend the performance debate using the 2000 version of ISO. We do so by considering performance as a formative construct rather than a reflective construct (see Coltman et al. (2008))—all three papers we cite above (Terziovski et al., 1997; Naveh and Marcus, 2005; Benner and Veloso, 2008) used performance as a reflective construct. We examine if the incorporation of TQM concepts in the 2000 version is truly aligned with the TQM measures previously accepted in the academic literature. More explicitly, we pose three conceptual questions and one methodological question:

1. Has the 2000 version of the standard more impact on performance compared to the old one?
2. Are ISO 9001/2000 companies aligned more with TQM compared to ISO 9000/1994 companies?
3. Do the soft dimensions of TQM mark the primary improvement in ISO 9001/2000 from its earlier version of ISO 9000/1994?

4. Would framing performance as a formative construct contradict the results of earlier studies in any way that framed it as a reflective construct?

## 2. Literature review and hypotheses formulation

Since ISO 9000 series of standards first emerged in 1987, many authors found that ISO offered a reasonable first step toward implementing quality (Bradley, 1994; Claver et al., 2002; Escanciano et al., 2001; Gotzamani and Tsiotras, 2002; Skrabec, 1999; Stephens, 1997; Sun, 2000; Taylor, 1995; Tummala and Tang, 1996; Withers and Ebrahimpour, 2001; Yusof and Aspinwall, 2000). This initial version of ISO addressed quality issues in categories such as quality policy, quality documentation and quality planning. However, many authors also contended that the quality issues in ISO 9000 were addressed in a disjointed way scattered throughout the ISO document. The general impression at the time was that there did not seem to be an overarching TQM framework that guided the implementation of ISO requirements.

### 2.1. ISO and TQM

Many writers raised contentious issues about how well such a standard would compare with the overall TQM system (Goetsch and Stanley, 1998). It is true that there are common dimensions between ISO and TQM, and they rest largely on their emphases on process management and statistical tools. However, one consistent message that has come through in the writings of various authors (Gotzamani and Tsiotras, 2001; Lee et al., 1999; Reimann and Hertz, 1996; Zhu and Scheuermann, 1999) is that companies that were certified under ISO would still fall far short of implementing a comprehensive TQM system. Several authors (Goetsch and Stanley, 1998; Martinez-Lorente and Martinez-Costa, 2004) have presented a discussion of such comparisons between ISO and TQM.

One general consensus in the literature has been that TQM affects company performance significantly. For instance, Choi and Eboch (1998) showed how TQM practices have a significant impact on plant performance and customer satisfaction. Samson and Terziovski (1999) explained that behavioral factors in TQM were particularly strong predictors of performance. The question then remains whether the new standard, ISO 9001/2000, has in fact overcome the much debated shortcomings of the older version—that the 1994 version was lacking TQM practices and its subsequent mixed reviews regarding its impact on performance.

### 2.2. Implications of ISO for quality management and business performance

The old ISO 9000/1994 included 20 points that described categories ranging from management responsibility to statistical techniques. Contract reviews, design control, document and data control and purchasing were other categories. Under each of these 20 categories, there were more detailed descriptions of issues to be addressed. For instance, within the category of management respon-

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