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# Linking the firm's technological status and ISO 9000 certification: results of an empirical research

Carmen Escanciano<sup>\*</sup>, Esteban Fernández, Camilo Vázquez

*Departamento de Administración de Empresas y Contabilidad, Universidad de Oviedo, Facultad de CC, Económicas y Empresariales, Avda del Cristo, s/n-33071 Oviedo, Spain*

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## Abstract

This work presents part of the results of a multi-sector environment study undertaken in Spain on the Spanish firms' experience with the ISO 9000 certification and its consequences. Specifically, the article is focused on the analysis of the firm's technological status and its influence on the perception of the certification's results, as well as its possible relationship with the firm's decision to proceed towards Total Quality. The results show that the technologically superior firms are the ones that seem to be the most satisfied with the certification's results. In like manner, the analyses performed have enabled us to confirm the presence of a positive relationship between a high technological level and the firm's advance towards TQM. © 2002 Elsevier Science Ltd. All rights reserved.

*Keywords:* Quality; ISO 9000 certification; Technological level; Satisfaction; TQM

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## 1. Introduction

At present, companies are performing their activities in continually more changing, interrelated and uncertain environments. In this situation, entrepreneurial survival not only depends on a high degree of continuous competitiveness in order to remain in the market, but also on the possession of the necessary instruments and measures to achieve it. Nowadays, no one doubts that one of the conditions for assuring company survival and reaching a superior competitive position is constituted by quality, its improvement and of course, its proof. In this sense, the high quality of the products no longer represents an exceptional stroke of fortune, but is to an increasingly greater extent the result of quality programmes founded on very clear principles, such as those established by the ISO 9000. Unfortunately, on many occasions environmental pressures, rather than the desire for improvement, are the main stimulus for a multitude of organizations to implant quality systems such as the

above-mentioned norm and proceed with their certification. Therefore, the possession of a quality system is not considered a sufficient element of proof of managerial commitment to quality. Not until an organization has passed the evaluation of an independent accredited organism, that is, until it has become certified, is this commitment recognized.

Thus, the ISO 9000 certification has become the most utilized mechanism for differentiating quality companies from the rest. In some markets, it is considered an indispensable condition for contracting suppliers, and this in spite of the fact that its possession does not guarantee the firm's product and/or service quality, but rather only the regularity and consistency of its processes.

In any event, the certification's importance is reflected in the nearly 400,000 certified companies in the world, and in the immense quantity of publications, articles and investigative studies on this theme (Wenmoth and Dobbin, 1994; Weston, 1995; Vloeberghs and Bellens, 1996; Meegan and Taylor, 1997; Brown et al., 1998; Neergard, 1999; Bryde and Slocock, 1998; European Commission—DG III, 1997; Ho, 1994; Idris et al., 1996; Lee, 1998; Mann and Kehoe, 1995, among others). Thanks to these studies, it has not only been possible to learn of the reasons guiding the decision to become certified

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<sup>\*</sup> Corresponding author. Tel.: +34 985 10 28 14; fax: +34 985 10 37 08.

*E-mail address:* cescan@econo.uniovi.es (C. Escanciano).

and its benefits, but also of the proof of its potential for stimulating a firm's advance towards Total Quality.

From a reading of one of them, Vloeberghs and Bellens (1996), describing the experience of Belgian firms, the existence of a relationship between a high degree of satisfaction with certification and the firm's technological level may be deduced. These authors state that the companies that possess a high technological status are the ones most satisfied with the certification. In like manner, this work reveals that the firms with a superior technological level—and more specifically, those dedicated to high technology—are the ones that proceed onward to Total Quality Management to a greater extent once the ISO 9000 has been attained. This same conclusion was reached by Casadesús and Jiménez (1998), although their study was focused on the certification experience in Catalonia. As a revision of the literature shows that such affirmations have not been tested empirically, our intention in the present article is to give empirical support to them. To this end, we have put forward the following hypotheses:

*Hypothesis 1: A positive relationship exists between a firm's technological status and its satisfaction with the certification.*

*Hypothesis 2: The higher the technological status of a firm, the more likely is its advance towards Total Quality once it has become certified.*

With the object of testing their veracity, we have proposed this empirical study on the ISO 9000 certification in Spain, in which its actual effects on a company are analysed on a national and multisectorial level. Its main outcomes are presented subsequently.

## 2. Research methodology

Basic information contained on this essay is an excerpt of a wider work that tries to typify ISO 9000 certification reality in the Spanish industry. Our research started in May 1998 by designing a questionnaire. The principal investigative works and articles on both national and international level in the field of ISO 9000 certification were taken as reference. In order to test the viability of the designed survey a pre-test was run over a reduced sample of firms. This way, some difficulties that the designed questionnaire supposed for the surveyed firms arose, allowing us to modify them accordingly. During November, the final questionnaire was submitted to the 3864 companies integrating the database that we had produced based on the information provided to us by the "Centro Nacional de Información de la Calidad" (CNIC) (National Centre for Information on Quality) about companies certified in Spain by June 1998. In every case it was sent to the Quality Manager.

The deadline for the reception of questionnaires and as the start of data processing was 28 February 1999. During that month a detailed revision of received questionnaires was followed, leading us to reject some of them because of their inconsistency.

A total of 749 properly filled questionnaires (19.4%) were received. After its revising, information was typed, assigning numeric keys and codes to every different answer.

The sample is made up of 749 certified industrial and service companies operating within the national territory.

### 2.1. Sample characteristics

All geographic areas of Spain are represented as shown in Fig. 1. It may be observed that Catalonia, the Basque Country and Madrid are the regions that have the highest number of certified companies. This is logical, if we take into account that the largest part of the Spanish industrial plants, particularly those of the highest level of technology, are found in these territories (Buesa and Molero, 1992).

All respondents to the survey are certificated to ISO 9000: 29.7% to ISO 9001, 69.2% to ISO 9002 and 0.1% to ISO 9003. The results of this study have made clear that reasons that have led our companies to adopt certification are the firm's improvement in all areas and its adaptation to the environment, as opposed to others that are traditionally considered more important. Such is the case of customer pressure, as may be concluded from a reading of the results of studies undertaken in other countries such as the United Kingdom (Buttle, 1997) and Sweden (Carlsson and Carlsson, 1996). The demand to work with registered suppliers in these countries is the main argument put forward by the firms in favour of certification.

The activity undertaken by 60.8% of the firms under study is manufacturing, which reveals the traditional links between the ISO 9000 certification and industrial companies. As opposed to these firms, 26.2% are mainly dedicated to rendering services, and 13% combine this activity with industrial production. As can be seen in Table 1 almost all standard industrial classifications are represented.

Among the activity sectors with the highest representation in the database, it is worth mentioning met-mechanics and manufacturing of transport equipment (22.1%), chemicals (14.5%), electronics (11.7%) and transportation, communication and public utilities (8.7%). One observes, however, a quite diversified sector structure, which may be interpreted as a significant reflection of the Spanish sector structure that has obtained the ISO 9000 certification.

The size of responding companies by employment ranges from fewer than 20 employees to more than 1000 employees. As shown in Table 2, 74.2% of the firms

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