

The state of ISO 14001 certification in Greece

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Abstract

Consideration is given to the evaluation of the present state of ISO 14001 implementation, as determined by the penetration of certifications and of certification agencies within industries in Greece. After identifying nearly all certified enterprises by the end of year 2004, a large cluster of 153 enterprises (circa 80.5% of all certifications), for which published information was available, are analysed. The data used concern both individual enterprises and demographic averages for respective industrial activities (determined by industry and sector). Analysis reveals ISO 14001 to be mainly accepted in manufacture, with both services and commerce to seriously lag behind. Analysis by sector, a more detailed activity indicator, shows marked ISO 14001 penetration differences between sectors, suggesting the influence of activity-related practices as a major certification driver. Evidence is also provided for the existence of a sector-related certification culture associating ISO 14001 certification decisions with ISO 9000 sector penetration levels. In addition, relatively larger enterprises, but not necessarily more profitable, seem to seek ISO 14001 certification in most sectors. Finally, analyses of all main certification agencies identified in Greece demonstrate that, with one exception, the choice of agency is mostly independent of industrial activity as well as certified enterprise size and profitability.

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1. Introduction

Since 1996, when the ISO 14001 environmental management system (EMS) standard was introduced, the enterprises that either achieved or seek certification are still increasing in numbers. According to the latest available official data for the end of year 2004 [3], the awarded certificates exceeded 90,500 in more than 127 countries (increased to circa 103,600 in 133 countries at the start of year 2006 [23]). Although impressive, it is noticeable that this growth rate is considerably lower than that manifested by the ISO 9000 quality standards. In fact, nine years after its introduction (a comparable time period), there were over 162,500 ISO 9000 certificates issued, a figure nearly double the ISO 14001 certificates. It is also noticeable that the spatial diffusion of ISO 14001 at the global level is highly variable, with nearly 85%

of total certifications occurring in Europe and the Far East and very low certification levels at the U.S. (e.g. [11,21]).

From a theoretical viewpoint, there are two main motives for ISO 14001 certification. First, if properly implemented, certification (being either imposed by law or voluntarily adopted) forms the framework for improving environmental performance (e.g. [20]). Second, by obtaining an independent third party accreditation of their EMS, certified enterprises could establish a strong corporate image, achieving such benefits as improved relations with stakeholders and marketing advantages (e.g. [26]).

Extensive theoretical and empirical research on several aspects of the ISO 14001 standard has taken place to date. Among the main theoretical issues are the effective EMS design and implementation (e.g. [6,19]) as well as its integration with other standardised management systems, such as quality and health and safety management (e.g. [16,36]). On the other hand, most empirical research has been focused on the practical validation of theoretical arguments and recommendations.

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Concentrating on empirical research, although we do not intend to comprehensively review this vast body of findings, we simply note that most studies within this research paradigm address one (or more) of the following major issues.

- (a) Determination of factors that may affect observed differences in measured outputs either temporarily (e.g. [2,14,29,34,37,38]) or over time (e.g. [5,24,25,35]).
- (b) Determination of factors that may affect (or lead to) certification decisions (e.g. [8,10,15,24,30]).
- (c) Identification of certification trends and development of descriptive statistics (e.g. [4,7,13,22,28]).

Several (qualitative and quantitative) input factors, as well as output variables, have been studied within this research paradigm. In this context, the main outputs considered are various business and environmental performance indicators, such as sustainability, perceived certification costs or benefits and satisfaction with certification. Of the factors often found correlated with the above output measures it is worth mentioning enterprise size, various (internal and external) reasons for certification, perceived implementation difficulties and attitudes towards environmental protection. Being empirical, this research is inevitably based on the analysis of data from specific samples. Depending on the objectives, samples may consist of only certified or both certified and uncertified enterprises, the latter being used when certification as such is also a factor under investigation. Samples may further be limited to enterprises with common characteristics, such as industry, sector or country. With a few exceptions, data are obtained through questionnaire surveys.

The research in this paper forms part of an ongoing investigation designed to determine and explain existing certification trends within the Greek economy. This generally follows the established empirical paradigm, with particular emphasis on issue types (b) and (c) above. The major issues we address here are encapsulated in the following two research questions. How do certification decisions relate with the industrial activity of an enterprise? Do enterprises manifest any selective preference to particular certification agencies? In order to study these issues we have based our analysis on a large cluster of certified enterprises (153 enterprises, representing 80.5% of nearly all certifications in Greece by the end of year 2004), for which published information was available.

The information used was composed of both certified enterprises data as well as the respective industrial activity averages for all enterprises in each activity. We were, thus, able not only to study certified enterprises in isolation (as nearly all previous studies we know), but also to identify trends with reference to activity-based populations. Central among these trends is the *penetration* of ISO 14001 per se and of certification agencies within different industrial activities. Note that a closely related study focused on ISO 9000 certification has recently appeared [17]. In fact, the results of this study used here are as the basis for comparison between ISO 9000 and ISO 14001 certification trends in Greece.

The remainder of this paper consists of five sections as follows. First we present the research issues together with the methodology used for the analysis. We then present the results concerning certified enterprises and certification agencies. These are followed by a discussion of their implications, while the paper is concluded with a summary of the main findings and directions for future research.

2. Research issues and methodology

In this section we present the specific research issues we address and the methodological approach chosen, comprised data collection and data analysis.

2.1. Research issues

Taking into account its rather specialised character, it is natural to expect enterprises with environmentally hazardous processes or/and products to be the prime ISO 14001 EMS users. However, our current empirical knowledge on the type of enterprises mostly seeking certification remains more or less anecdotal. In fact, with no previous study having systematically addressed the issue, this is limited to the distribution of enterprises that responded to particular cross-industry questionnaire surveys. Since manufacturing enterprises usually constitute the highest proportion of responses, ISO 14001 has been inferred to be particularly popular in manufacture (e.g. [22,37]). However, such a deduction cannot by any means be conclusive, suffering from that it ignores the underlying population demographic status [17]. It is with a first systematic investigation of the relation between industrial activity and EMS certification that we are concerned in this paper.

We investigate the relation between ISO 14001 and industrial activity using two hierarchically related activity indicators, namely, industry and sector. The term *industry* refers to the basic activity of the enterprise (being manufacture, service or commerce), and corresponds directly to the activity classification scheme used in most surveys already cited. The term *sector* links the basic activity of an enterprise with a particular segment of the economy (e.g. wood products, foods, etc.), thus providing a far more specific characterization of the enterprise activity, associating it with a specific operating environment. Two other factors, often studied in association with the certification process, are used as investigation parameters, namely, enterprise size (e.g. [4,10,12,15,37]) and profitability (e.g. [7,27,37]). In this research, however, these factors are only considered for comparing enterprises of the same industrial activity, practically eliminating the interpretation problems caused by the existence of different activity-related norms (i.e. a management consultancy with 60 employees is rather large within its own sector but very small, if manufacturing enterprises are jointly analysed).

Surprisingly few previous studies have explored possible relations between ISO 9000 or ISO 14001 certification agencies and certified enterprises (e.g. [1,13,17]). Considering, however, that these are the principal poles of the certification process, relationships could exist, resulting in the manifestation of

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