



The effect of ISO quality management system standards on industrial property rights in Turkey



Burhan Başaran

Department of Food Engineering, Recep Tayyip Erdoğan University, Rize, Turkey

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ABSTRACT

The aim of this study was to assess whether the systematical application of the following ISO quality management system standards: ISO 9001 (Quality Management System), ISO 22000 (Food Safety Management System), ISO 14001 (Environment Management System), ISO 13425 (Medical Device Quality Management System), ISO 27001 (Information Security Management System) and ISO 16949 (Automotive Quality Management System) have had an effect on the emergence of industrial property rights in Turkey. Information was collected about the number of ISO standard certification documents that Turkish organizations received in respect of these standards between the period of 2007 and 2013. For the same period, information about the number of granted patents, petty patents, trademarks and industrial designs in Turkey were also collected. The information was analyzed by year, industrial property right type and ISO standard. A Spearman correlation analysis was also conducted to determine the strength of association between the number of certification documents and the number of granted industrial property rights. The analysis showed that some of the ISO standards had either a positive or negative linear relationship with one or more of the granted industrial property right types. Although the total number of certification documents had decreased over the time period of the study, the number of granted industrial property rights in Turkey had increased over the same period indicating that the adoption of quality management system standards may have led to an increase in national innovation in Turkey. This observation may help to improve innovation in other countries similar to Turkey.

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1. Introduction

Globalization with its hundred year history obliged a lot of functional and structural changes in different establishments. At the same time, the development of technology increased the diversity of the products or services presented to the market. Globalization has enabled a product or service produced in any region of the world to become marketable to any other consumer group or establishment in the world [1]. Rising diversity and increasing market size have caused new establishments to start businesses and the world economy to begin to reshape. Protecting an established business' profits with the emergence of these new establishments has become harder than ever. As a result, establishments are competing vehemently in the new economical order [2,3].

Porter (2011) indicates that there is a linear relationship between the competitive power amongst establishments and the life quality of society. One of the factors affecting competition is the

productivity rise of establishments. Porter asserts that as product quality increases it affects the productivity as well. He claims that it is only possible for establishments to compete at a superior level on the basis of innovation rather than cheap labor [4]. In addition, nonconformist approaches towards customer satisfaction or product design can enable a business to be one step ahead of their rivals [5,6].

At the same time, the concepts of novelty and innovation, in the marketplace are used interchangeably, in addition to the several different descriptions each can have [7]. On the one hand, the concept of novelty can be defined in relation to the concept of marketability, as a new or advanced product approach or service [8]. On the other hand, it can be thought of as a conversion of an idea to a marketable product or service, a new or advanced product or distribution approach or a new social service method in the OECD and EU documents [9].

The systems and concepts involved in an innovative approach are the means for success of establishments [10]. Although studies on innovation show that superiority amongst rivals can be achieved

E-mail address: burhan.basaran@erdogan.edu.tr.

by adopting an innovative approach, an innovative approach is not adopted by all and even if it is, the emerging innovations are not supported by systematic approaches. In this regard, the establishments should adopt a systematic novelty approach [11–13].

Zeren et al. identified 12 criteria that enable a firm to be innovative. They assert that some of these criteria include “quality management systems” and industrial property rights including trademarks, patents, petty patents and industrial designs. The innovativeness of a firm is also defined by Zeren et al. as the ability to develop a new product [14]. Industrial property right ownership shapes the acceleration and direction of innovative and entrepreneur approaches structuring today’s economy, economical recovery and investment [15].

The number of the studies examining the relationship between the quality management system standards and innovative performance of firms is quite few and there is no consensus on this issue [16,17]. Whereas some firms think that management standards restrict them [17], other firms who use the standards are observed as having begun an innovative process [18,19]. The studies conducted to date on the relationship between management systems and the innovative performance of firms conclude that there needs to be more research on the issue [16].

It has been generally accepted by a great deal of researchers that constant and systematic changes will be experienced by firms as a result of interaction of constant improvement, process management, customer orientation, management of human resources and dedicated involvement which are the main principles of total quality management and the innovation process [16,17,19,20].

It is interesting to note that not only companies, but some countries as whole have been undergoing an innovation movement in the past decade. The rate of research and development (RD) expenditure in Turkey for example, as part of the gross domestic product (GDP) has increased from 0.48% in 2003 to 0.92% in 2013 [21]. In comparison, the rate of R&D expenditure as part of GDP in EU member countries, increased from 1.86% in 2003 to 2.07% in 2012. Although the R&D expenditure of Turkey has come close to Italy and Spain, it has fallen behind Germany and France [22]. Further, according to research completed in 2009 on the amount reserved for innovation and research studies by EU countries, Finland and Sweden, followed by Switzerland and Austria, were found to be the countries with the highest allocated amounts, whereas the Balkan States and Turkey were found to allocate the least amount to innovation studies [23].

Although Turkey ranked low in these studies, improvement in innovativeness is evident. For example, the Global Innovation Index published in 2014 [24], ranked 143 countries according to each country’s innovativeness. The inputs of innovativeness included finance and education policies while industrial property rights, technology transfers and research and development results constituted the outputs. According to the 0–100 point scoring system used, the top three innovative countries in 2014 were Switzerland with a score of 64.8, England with a score of 62.4 and Sweden with a score of 62.3. At the same time, Turkey climbed 20 positions from its 74th position in 2012 with a score of 34.1 to the 54th position in 2014 with a score of 38.2 [24,25]. In the rating system of World Rivalry Index published in 2014, Turkey also improved its ranking as 48th in 2005 by being ranked 37th in 2013 [26].

In order to understand the improvement in innovativeness ranking of Turkey from 2007 to 2013, this study examined whether quality management systems embodied in the following internationally recognized standards ISO 9001 QMS, ISO 22000 FSMS, ISO 14001 EMS, ISO 13425 MD-QMS, MD, ISO 27001 ISMS and ISO 16949 A-QMS had an impact on the development of industrial property rights in Turkey. The study aimed to evaluate whether the

use of these standards in Turkey to improve innovatives could be used as an example by other developing countries. In order to understand the potential impact a standard may have on the development of industrial property rights in Turkey, it is necessary to review a description of each as provided below to understand the goal of each standard.

2. International standards of organization (ISO)

The International Standards of Organization center was established by the United States of America in 1947 in Geneva, Switzerland. It is an organization standard that has 163 members, four of which are subscriber members, 41 of which are reporter members and 118 are member establishments. The member for Turkey is the Turkish Standards Institution (TSI). The main purpose of the ISO is to review applications for international standards and conduct inspections to ensure standards are met in order to eliminate differences of standards between countries and to improve trade [27,28].

For the purpose of this study, we selected ISO 9001 QMS, ISO 22000 FSMS, ISO 14001 EMS, ISO 13425 MD-QMS, ISO 27001 ISMS and ISO 16949 A-QMS, each of which is described below.

2.1. ISO 9001 quality management system (QMS)

ISO 9001 standard defines the requirements for documentation structure in an establishment, the organization chart, assignment and authority responsibilities, the useful and active usage of the resources, customer satisfaction, the collecting and analyzing of data, the relationship of the processes, the active management of storage, production and other processes such as purchasing, the design and development of a product, internal supervision and constant betterment. The main purpose of the system is to prevent fault and defaults that can emerge. ISO 9001 standard can be applied in establishments that operate in all sectors without considering the type of industry or the size of the establishment as judged by the number of employees. Different quality management systems consisting of standard procedures for every establishment can be built [29,30].

We can define the benefits of ISO 9001 standard as the internal and external benefits for the establishment. The internal benefit for the establishments can be numbered as cultural change of the staff, organized behaviour, and the constitution of the quality awareness in the establishment, the efficiency of management, planning, better documentation, the rise in activity and productivity and the decrease in costs. The external benefits can be defined as customer satisfaction and loyalty, the increase of market share, being ready for official supervisions, gaining strength for the establishment’s image and escalating its competition power [31,32].

The chronological development of ISO 9001 Quality Management System is shown below [33,34].

- MIL/Q/9858 standard was prepared for defense technology in USA in 1963.
- AQAP standard were started to be used in NATO countries in 1968
- BS 5750 standard was constituted in England in 1979.
- ISO 9000 series were published by ISO in 1987.
- EN 29000 standards was published by CEN in 1988.
- TS 6000 were published as Quality Guarantee System Standards in 1988.
- It was overhauled by ISO in 1994 (9001:1994/9002:1994/9003:1994).
- EN 29000 series was published as EN ISO 9000 in 1996.
- It was overhauled by ISO in 2000 and published as 9001:2000.

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